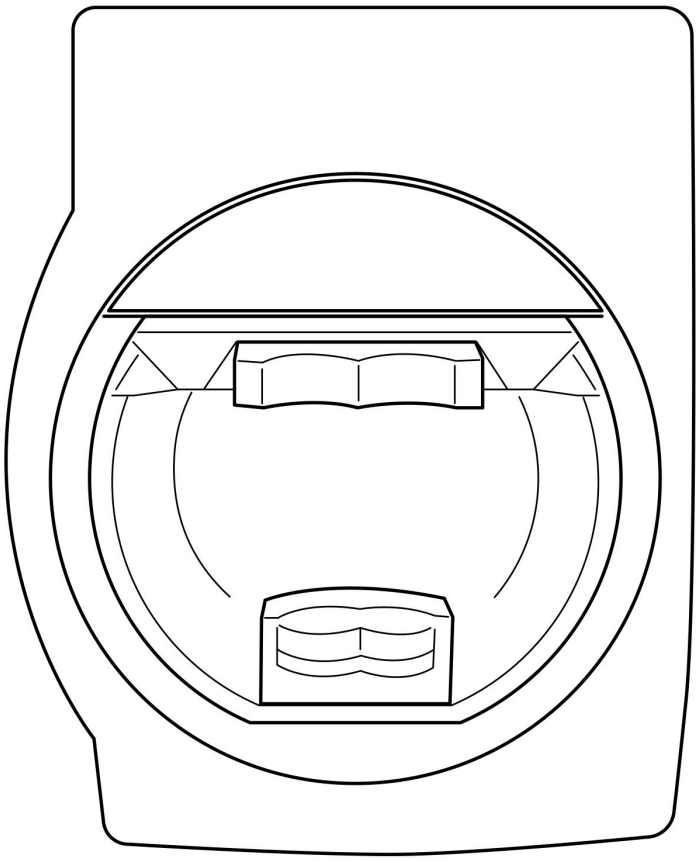
PERIMETER

Operation Manual



Preface

Dear Users:

Thank you very much for choosing EPR-3600 automatic computer perimeter manufactured by us.

For your security and benefit, please read the <Operation Instruction> as well as all the datum of the instrument carefully before using it.

If you do not operate the instrument according to the Operation Instruction, we shall not take any responsibility.

About <Operation Instruction> of this Instrument

The copyright of the operation instruction belongs to us;

We have the right of interpreting and revising this operation instruction.

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Chapter 1 Summarize

1. Brief Introduction

Projection perimeter， adopt the advantage of international advanced model, projection working mode， with wide testing range 0-90°.It has the characteristics of full-function, high precision and speed. Besides the above characteristics, the whole system also has the characteristic of high dependability and steady performance. Software support Windows XP,WIN7 and Win 8 system with easy operation interface. Kinds test program and strategy, standard test report and analysis software, Provide auxiliary diagnosis for vision damage related diseases

2. Notice for use

2.1 For your security and benefit, please read the <Operation Instruction> as well as all the datum of the instrument carefully before using it.If you do not operate the instrument according to the Operation Instruction, we shall not take any responsibility.

2.2 Use it in a darkroom and it can only be operated by those who have been trained by engineers of us.

2.3 The stimulus and PC system can be used in patient environment, printer should be used outside of patient environment.

2.4 The voltage must be up to the given standard. If the voltage is not steady, please install a Constant Voltage Regulator. We will not take responsibility for the damage caused by the voltage.

2.5 Do not use this instrument in the inflammable, hot and dusty environment and pay attention to keep it clean and dry; To avoid being damaged by the environment (Damp, Dusty, Liquid, under the sun and so on).

2.6 Do not let the liquid or any other small objects run into the instrument, otherwise these objects may make the inner parts of the instrument short-circuit, and even make the users get an electric shock or even cause a fire hazard.

2.7 Without the permission of us, do not open the box of the instrument or we will not take the consequences

2.8 If you need restart the instrument,you can open the perimeter after 5 seconds and open the

computer after 15 seconds after turning off.

2.9 Environmental protection clause:It will pollute the environment if you discard the equipment and the accessories which is breakdown, recall or disposal according to the local laws and regulations.

2.10 Rated operating loaded and safe working load of chin rest is 5kgs.

About the instruction:

1. If it breaks down, please read the guide to fix the breakdown. If it does not work yet, please contact us.

2. We have the right of interpreting and revising this operation instruction.

3. Structure components

a）Hardware: It's mainly structure by computer system, perimeter stimulus, printer, and socket

b）Software: The patient information input module, Image processing modules, Document management modules,output & print module：

4. Applicability

This instrument is used for examining the change of visual field which may be hurt by glaucoma, visual disease, disease of brain surgery and disease of retina.

5. Notes

To avoid being damaged by the environment (Damp, Dusty, Liquid, under the sun and so on), the instrument should be putted at the dry place.

Do not let the liquid or any other small objects run into the instrument, otherwise these objects may make the inner parts of the instrument short-circuit, and even make the users get an electric shock or even cause a fire hazard.

6. Manual

Effective for model： EPR-3600

7. Product features

Fusing parts: T2AL 250V

Security type：It belongs to B type instrument

The instrument is intermittent working form

Symbolic interpretation：

Notes！Look through the manual

Power on

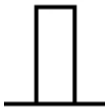
Power off

Earth wire

B type instrument

Alternating current

Connected（Responder）


Disconnected（Responder）

USB Port

Chapter 2 Technical Parameter

2.1 Technical Index

2.1.1 Background light

a) Background light：white， intensity 10 cd/m^2。

b) Background light：yellow， adopt OG530 lens，intensity 100cd/m^2。

2.1.2 Stimulus testing, the allowance under limitation listed in Table 1.

Table 1: Stimulus Parameter

S/N	Content	Allowance
1	Background light，L_B	+25%，-20%
2	Contrast，$\Delta L/L_B$	+25%，-20%
3	Stimulus location	0°～10°：≤0.5°
		10°～30°：≤1°
		＞30°：≤2°
4	Stimulus size	Conversion to solid angle：+20%，-15%
5	Stimulus duration	±20%

Table 2 Stimulus Size Paramter

Azimuth θ	eccentric angle Φ		b/a	solid angle Ω
0°	15°		>0.7	6.66E-05
	40°		>0.6	1.00E-04
45°	15°		>0.7	8.00E-05
	40°		>0.5	1.29E-04
90°	2°	I	>0.7	2.50E-06
		II	>0.8	1.10E-05
		III	>0.8	6.50E-05
		IV	>0.8	2.14E-04
		V	>0.8	6.50E-04
	15°		>0.7	8.44E-05
	40°		>0.6	1.10E-04
135°	15°		>0.7	6.66E-05
	40°		>0.6	1.15E-04
180°	15°		>0.7	6.22E-05

	40°	>0.6	9.00E-05
225°	15°	>0.7	6.50E-05
	40°	>0.6	7.99E-05
270°	15°	>0.7	6.30E-05
	40°	>0.6	7.20E-05
315°	15°	>0.7	6.50E-05
	40°	>0.6	9.20E-05

Table 3-1 Stimulus contrast ratio（White stimulus-White background）

dB	Stimulus Intensity $L_s - L_B$ cd/m^2	Luminance L_s cd/m^2	Contrast $(L_s - L_B)/L_B$
0	3421.0	3431.0	342.10
1	2898.5	2908.5	289.85
2	2160.5	2170.5	216.05
3	1653.7	1663.7	165.37
4	1367.2	1377.2	136.72
5	1075.2	1085.2	107.52
6	854.73	864.73	85.47
7	674.10	684.10	67.41
8	547.33	557.33	54.73
9	426.74	436.74	42.67
10	333.40	343.40	33.34
11	270.32	280.32	27.03
12	234.00	244.00	23.40
13	200.65	210.65	20.06
14	159.60	169.60	15.96
15	110.21	120.21	11.02
16	90.47	100.47	9.05
17	63.50	73.50	6.35
18	50.24	60.24	5.02
19	40.82	50.82	4.08
20	31.85	41.85	3.18
21	25.69	35.69	2.57
22	20.26	30.26	2.03
23	16.59	26.59	1.66
24	12.70	22.70	1.27
25	10.05	20.05	1.00
26	8.10	18.00	0.81
27	6.86	16.86	0.69

28	5.06	15.06	0.51
29	4.10	14.00	0.41
30	3.19	13.19	0.32
31	2.57	12.57	0.26
32	2.00	12.00	0.20
33	1.60	11.60	0.16
34	1.27	11.27	0.13
35	1.00	11.00	0.10
36	0.80	10.80	0.08
37	0.64	10.64	0.06
38	0.50	10.50	0.05
39	0.40	10.40	0.04

Table 3-2 Stimulus contrast ratio（Blue stimulus-Yellow background）

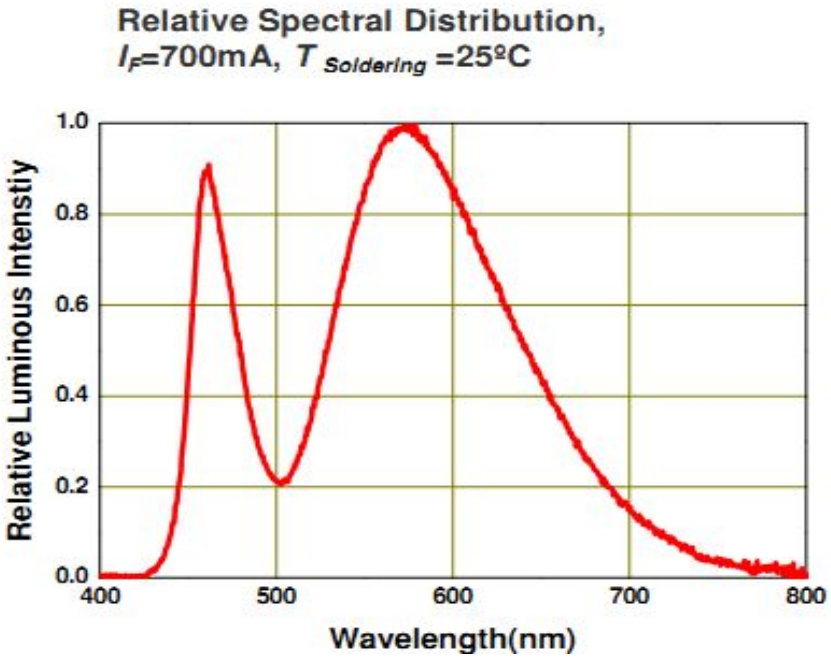
dB	Stimulus Intensity $L_s - L_B$ $\mathbf{cd}/m^2$	Luminance L_s $\mathbf{cd}/m^2$	Contrast $(\mathbf{L}_s - \boldsymbol{L_B})/\boldsymbol{L_B}$
0	65.34	165.34	0.6534
1	48.05	148.05	0.4805
2	39.98	139.98	0.3998
3	31.92	131.92	0.3192
4	25.52	125.52	0.2552
5	20.69	120.69	0.2069
6	16.92	116.92	0.1692
7	13.12	113.12	0.1312
8	10.31	110.31	0.1031
9	8.14	108.14	0.0814
10	6.34	106.34	0.0634
11	5.12	105.12	0.0512
12	4.24	104.24	0.0424
13	3.54	103.54	0.0354
14	2.76	102.76	0.0276
15	1.95	101.95	0.0195
16	1.51	101.51	0.0151
17	1.15	101.15	0.0115
18	0.89	100.89	0.0089
19	0.65	100.65	0.0065
20	0.52	100.52	0.0052

Table 3-3 Stimulus contrast ratio（Red stimulus-White background）

dB	Stimulus Intensity $L_s - L_B$ $\mathbf{cd/m^2}$	Luminance L_s $\mathbf{cd/m^2}$	Contrast $(\mathbf{L_s - L_B})/L_B$
0	545.00	555.00	54.500
1	386.83	396.83	38.683
2	314.52	324.52	31.452
3	246.12	256.12	24.612
4	193.73	203.73	19.373
5	155.42	165.42	15.542
6	126.92	136.92	12.692
7	97.50	107.50	9.750
8	78.41	88.41	7.841
9	61.26	71.26	6.126
10	49.07	59.07	4.907
11	40.00	50.00	4.000
12	33.05	43.05	3.305
13	28.36	38.36	2.836
14	21.37	31.37	2.137
15	16.55	26.55	1.655
16	13.55	23.55	1.355
17	10.87	20.87	1.087
18	8.70	18.70	0.870
19	6.75	16.75	0.675
20	5.17	15.17	0.517
21	3.76	13.76	0.376
22	3.26	13.26	0.326
23	2.73	12.73	0.273
24	2.06	12.06	0.206
25	1.61	11.61	0.161
26	1.40	11.40	0.140
27	1.04	11.04	0.104
28	0.78	10.78	0.078
29	0.63	10.63	0.063
30	0.60	10.60	0.060
31	0.51	10.51	0.051

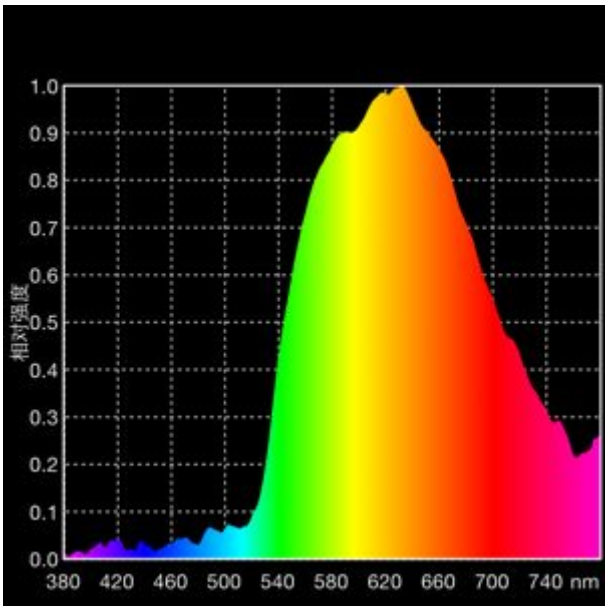
2.1.3 Spectral distribution of Background light and stimulus (white, red,blue)

2.1.3.1 White background spectrum, white stimulus spectrum



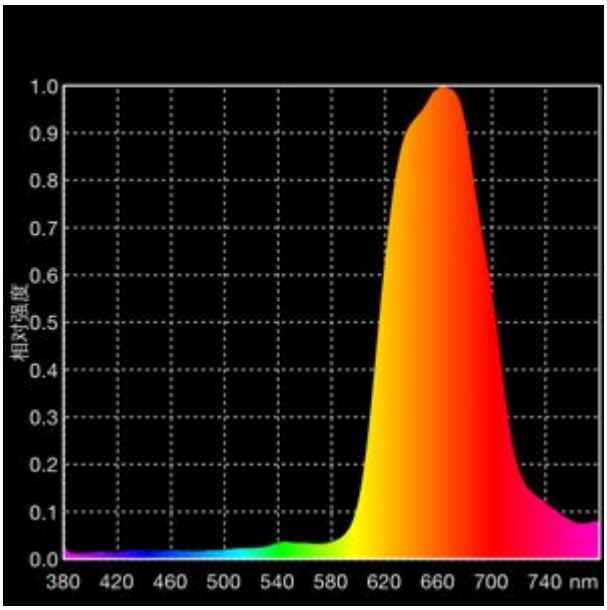
White background spectrum, white stimulus spectrum

2.1.3.2 Yellow background spectrum (OG530)



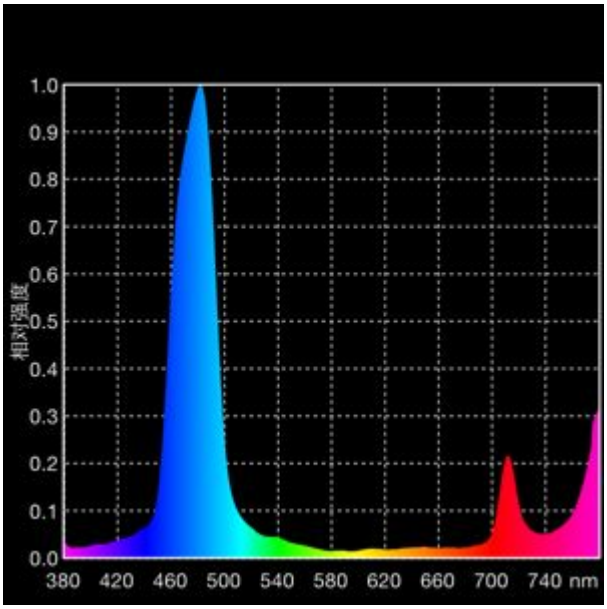
Yellow background spectrum

2.1.3.3 Red stimulus spectrum（RG610 filter）



Red stimulus spectrum

2.1.3.4 Blue stimulus spectrum (GG400)



Blue stimulus spectrum

2.1.4 Stimulus range: full field 90°，testing stimulus minus eccentric angle conform to the requirement in table 4.

Table 4

Content	minus eccentric angle ϕ
Nasal	45°
Bitamporal	70°
Upper	45°

Under	60°

While testing，Nasal testing should be proceeded under Nasal step screening test mode. Botamporal testing should be proceeded under FF135 Screening test mode. Upper and Under should be proceeded under 60-4 threshold test mode.

2.1.5 Stimulus location amount and stimulation time：

a) Stimulus location amount: cannot less than the requirement listed in table 5

Table 5

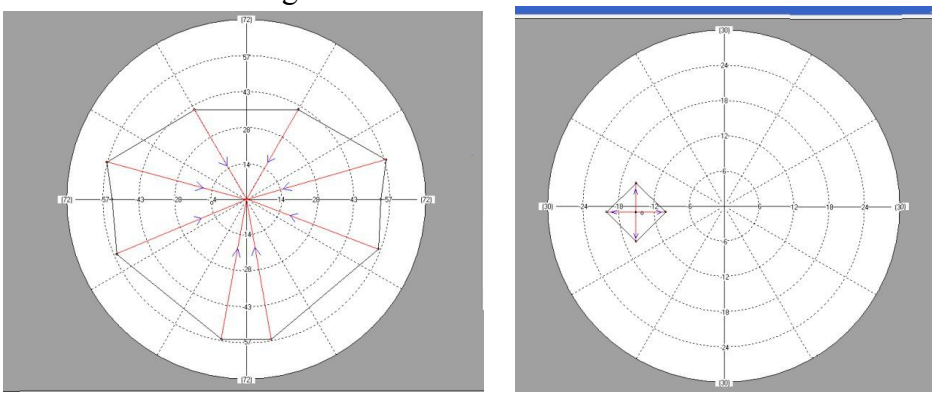
Eccentric angle ϕ	Minimum amount
0°～25°	60
＞25°～50°	30
＞50°～70°	15
Sum	105

b) Stimulus time of duration：

Kinetic：Movement speed：1°/sec-9°/sec adjustable

Move mode：Straight line

Sample：



Static：Stimulus time of duration 200ms

Stimulus interval：

1).If no response from patient, stimulus interval default as 1000ms;

2).If patient response，the system will adjust the stimulus interval according to the weighted average of last 5 patient respond speed，if patient respond slow then the stimulus interval will be automatically prolong. If patient respond fast then the stimulus interval will shorten automatically

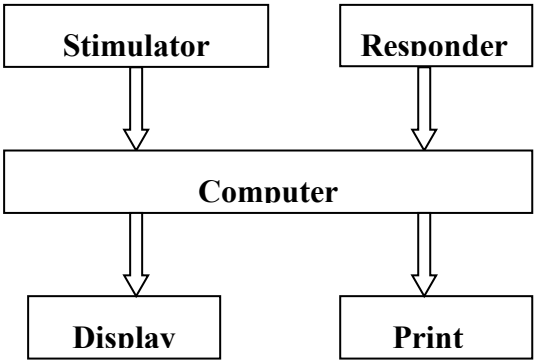
2.1.6 The distance between patient eye and the fixation：300 mm±10 mm。

2.1.7 The instrument have head location device, and configure movable chinrest and forehead rest, their travel distance from left-right ≥30 mm，and the chin rest of chinrest from up-down ≥50 mm.

2.1.8 This equipment configure auto calibration function for stimulus intensity, device will calibrate the background intensity and stimulus intensity automatically while operator power on the equipment.

2.1.9 Input power：300VA。

2.2 Flowchart



2.3 Working principle

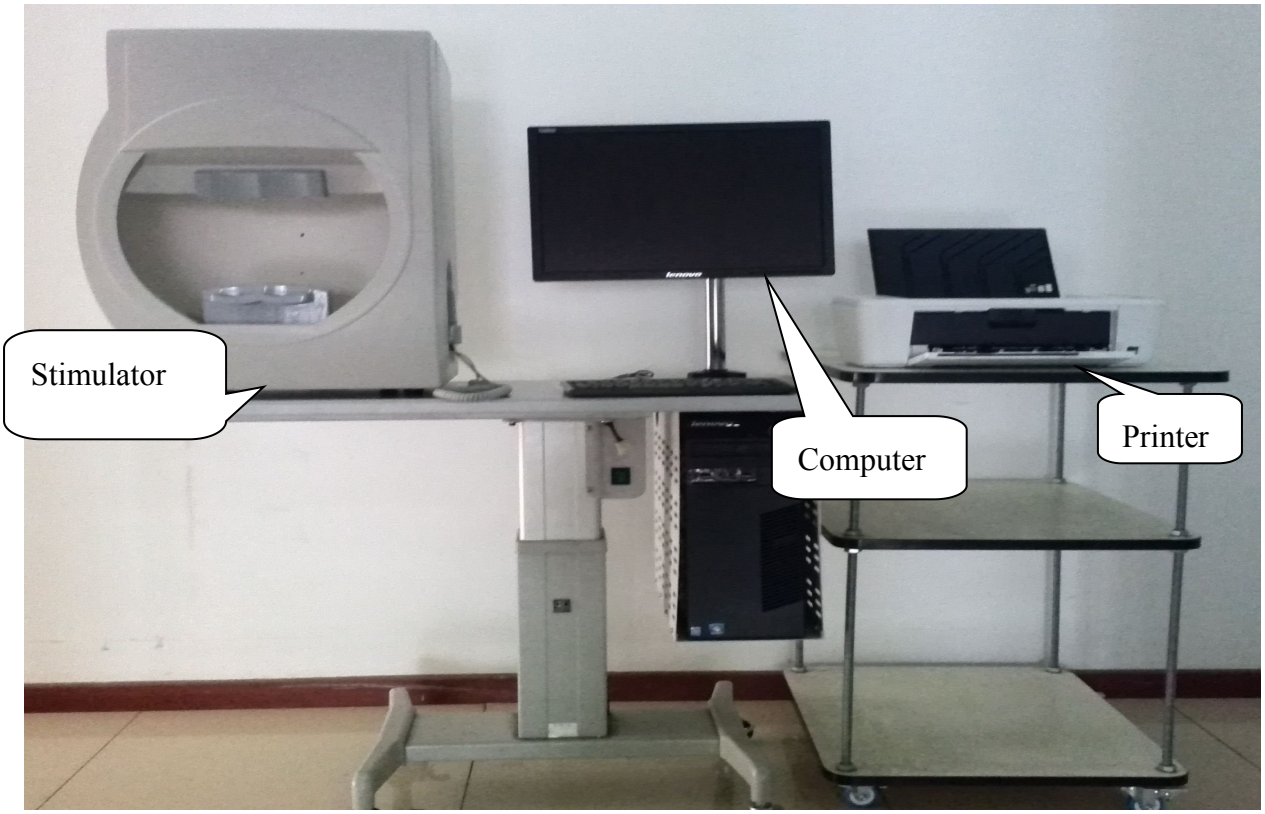
The working principle of the perimeter is to examining the sensitivity of the human eye to light stimulus which enable to check the lesions of optic nerve, retina, visual pathway etc. The ambient light enter into retina by refraction system, then the retinal generate the photochemical reactions which produce the bioelectrical which transmitted through the visual pathway to visual cortex, so that the brain could generate the vision through a comprehensive analysis. Any part of the distribution and the trend of the nerve fibers from the retina to the visual cortex could indicate the lesions which happened on the visual pathway. The lesion part, the characteristic and prognosis can be all analyzed by applying the clinic test results according to its visual transform.

Chapter 3 Installation

1. Hardware

EPR-3600 projection perimeter have already been inspected and tested before leaving factory. Please check if all accessories listed on list provided or not,any question, please contact with seller immediately.

Please check accessories on list.



Picture of Whole instrument

▲ Main Spare-Parts

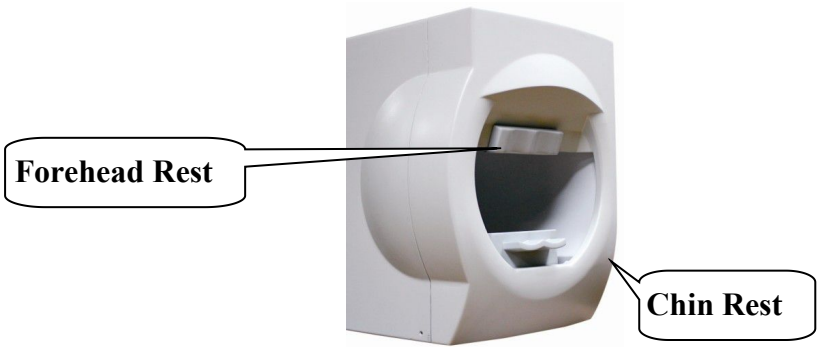
Printer

Responder

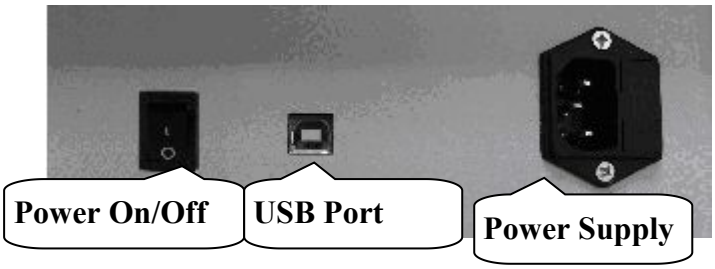
USB Wire

Power wire

▲ **The Front Picture of the Stimulator**



▲ **The Back Picture of the Stimulator**



2. Working Environment

Environment temperature：5℃-40℃

Relative humidity：≤85%

Atmospheric pressure range：760 hPa～1060 hPa

Power： a.c.100~240V； Frequency：50Hz

Inputting power： 300VA

3. Installation environment

3.1 The instrument must be installed in the flat ground with no slope;

3.2 The instrument must be installed in the clean, quiet and dry room;

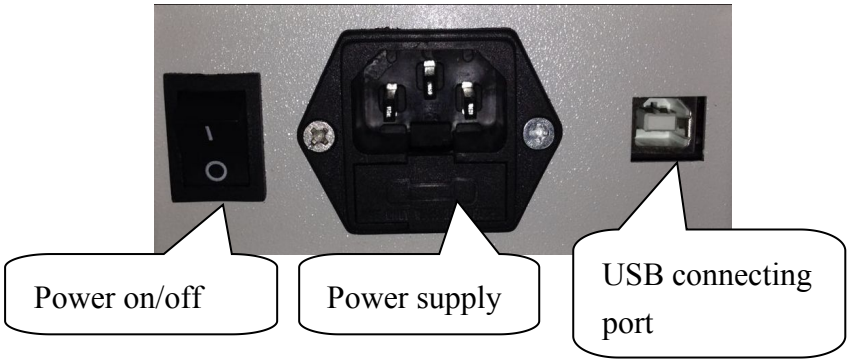
3.3 The instrument must be installed in the dark room where nothing can be seen within one meter.

3.4 The instrument must be installed with special ground wire;

3.5 The instrument require the exclusive ground wire.

4.Hardware setup

4.1 Connect Perimeter and Computer with the new USB Serial Port Wires we provide.



4.2 Connect the Power of the Perimeter.

4.3 Take out the fixed foam inside the Perimeter. Fix the Responder into the connector.

4.4 Connect the USB cable to computer, and install computer and printer accordingly.

5.Software setup

5.1 Windows System Requirements

English/ Simplified Chinese Version Window XP 32 bit Professional

English/ Simplified Chinese Version Windows 7 32bit/ 64bit Professional

English/ Simplified Chinese Version Windows 7 32bit/ 64bit Ultimate

or English/ Simplified Chinese Version Windows 8 32bit/64bit Professional

PS: Our perimeter software only support English/ Simplified Chinese Version Windows system, if user running others language Windows system, there will be unreadable code showed during install

procedure and on software, or other unpredictable error will be occur. Please use relevant system we recommended.

Please note the software will be default installed in folder C automatically.

5.2 Hardware Requirements

Before you install PERIMETER V-2.0, make sure your computer meets the following minimum requirements:

***CPU**

Mainboard: Intel chipset

Processor：≥1.7Ghz

multicore：Dual core，4 threaded.

*** Memory minimum**：≥2GB

*** Hard disk**

Rotational Speed：≥7200 RPM (Solid-state drives without this parameter）

Caching：≥2MB

Space：≥500GB

***Display**

Supporting 1440 * 900 resolution or greater，1440 * 900 recommended.

Perimeter software show normally on resolution of：1440*900，1600*900，1920*1080.

*** USB 2.0 Port**

▲Make sure there are at least 2 partition “C:” and “D:” existing in the hard disk, Otherwise the software will run error. Software will go wrong;

▲Make sure there is at least 5GB free space for data storage in partition “D”, otherwise the software will go wrong.

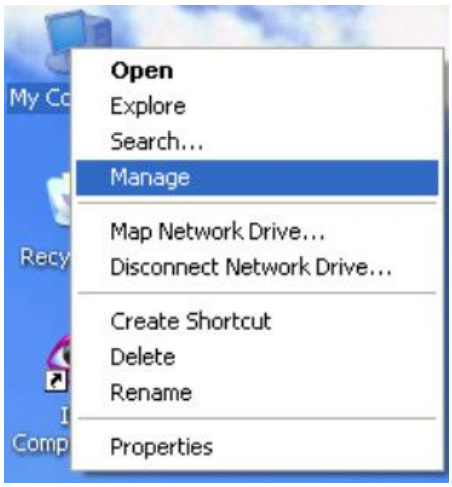
5.3 After you install the computer system software, Insert install disk we provided into CD-ROM and copy all the files we provide to your computer’s “D” partition, After the installation, **please Do keep the disc well !**

5.4 Software installation procedure

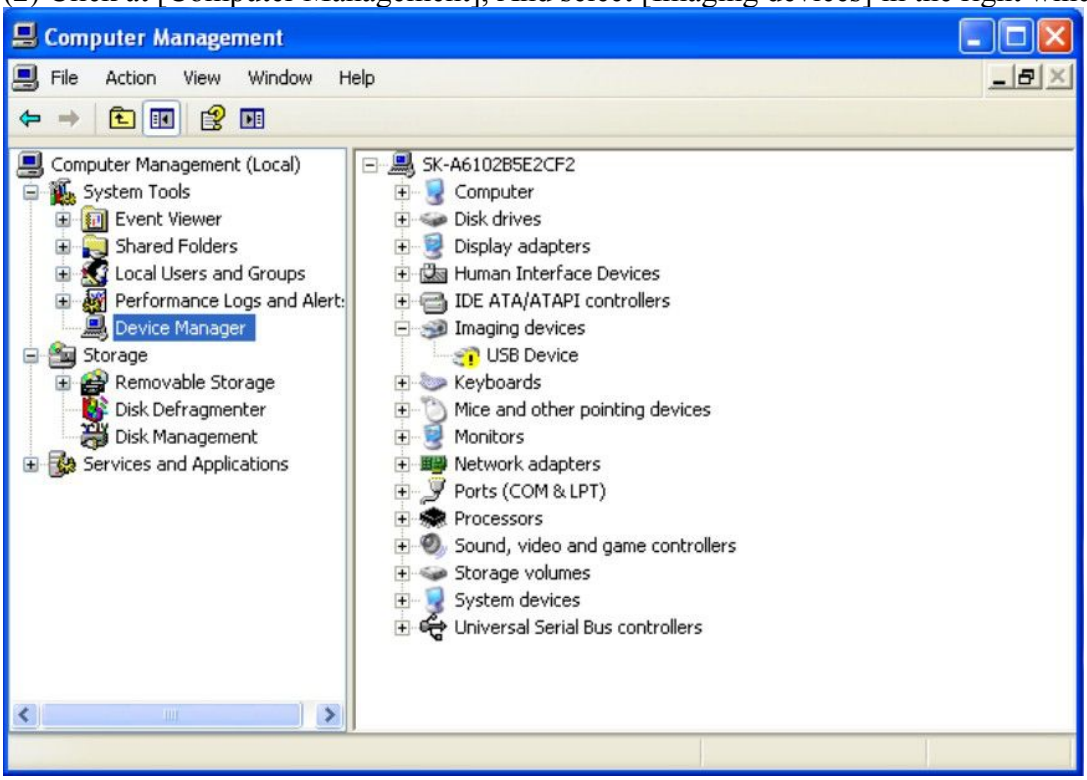
5.4.1 Install USB capture card driver for computer

A:If you run **Win XP system**,please install the capture card driver as followed steps:

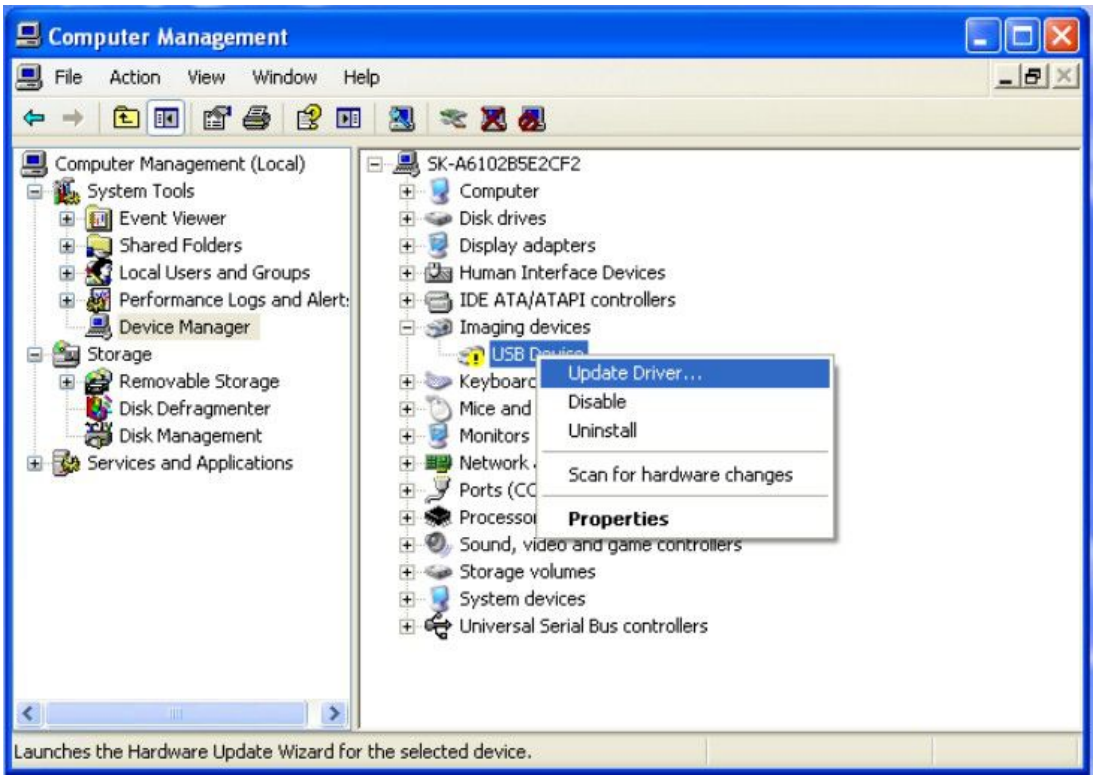
(1) Right click at [My computer],select [Manage] and enter in [Computer Management]



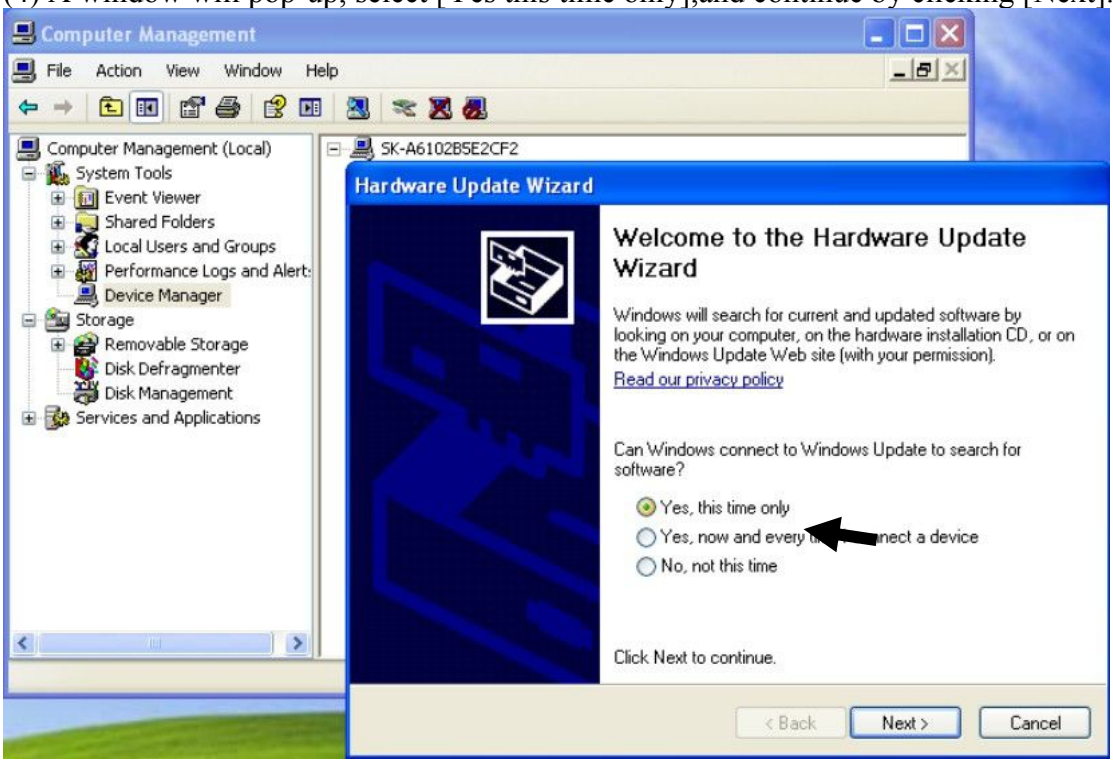
(2) Click at [Computer Management], And select [Imaging devices] in the right window.



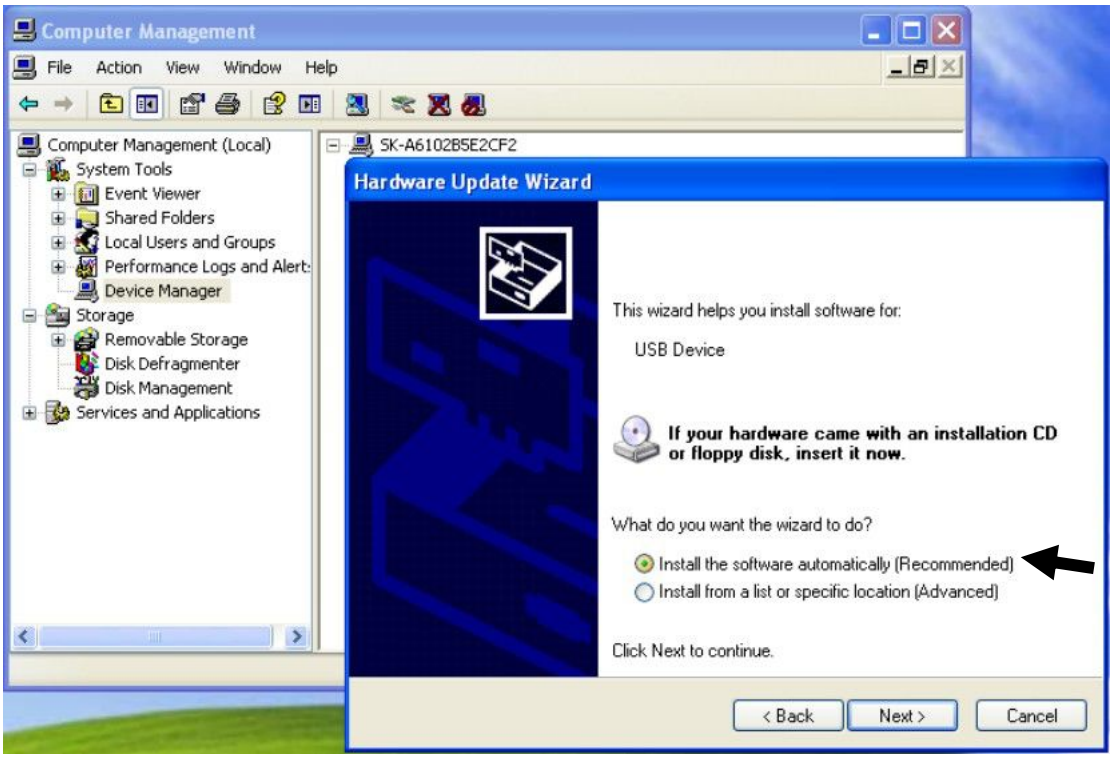
(3) Right click at [USB Driver] and Click at“Update Driver”as followed pic.



(4) A window will pop-up, select [Yes this time only],and continue by clicking [Next].


Computer Management
File Action View Window Help
Computer Management (Local)
System Tools
Event Viewer
Shared Folders
Local Users and Groups
Performance Logs and Alert
Device Manager
Storage
Removable Storage
Disk Defragmenter
Disk Management
Services and Applications
SK-A6102B5E2CF2
Hardware Update Wizard
Welcome to the Hardware Update Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every
nect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

(5) A window [Hardware Update Wizard] will pop-up, select {Install the software automatically [Recommended]},then click [Next]

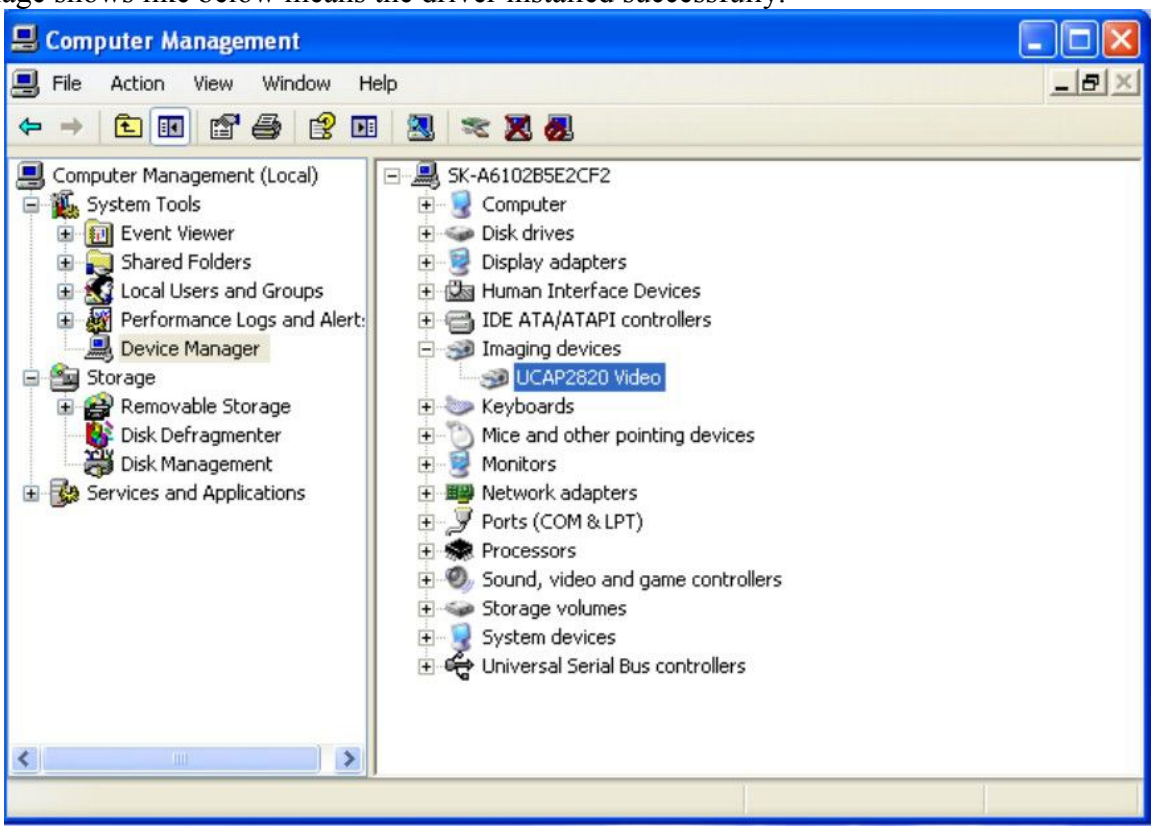


(6) A window pop-up like bellow, select [Continue Anyway]

Hardware Installation
The software you are installing for this hardware:
UCAP2820 Video
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

(7) Click [Finish] to end the installation

(8) Image shows like below means the driver installed successfully.



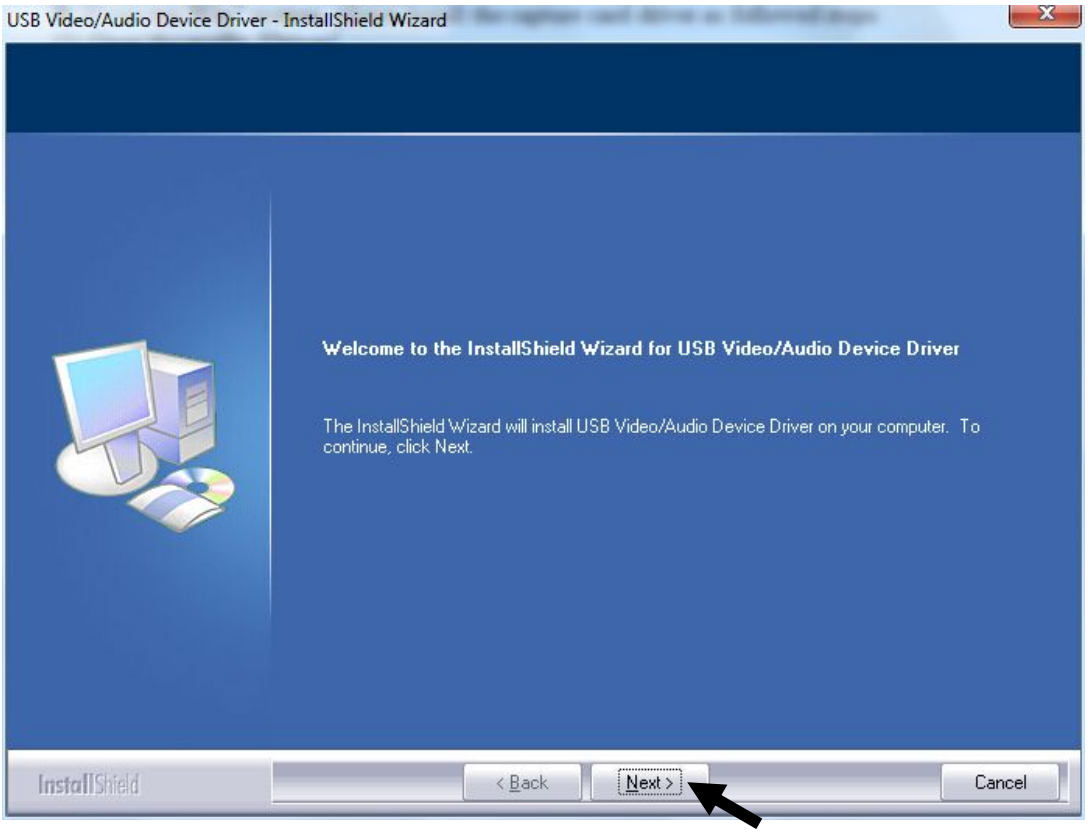
B: If you run **Win7 system**, please install the capture card driver as followed steps:

(1) Open the profile [Driver]

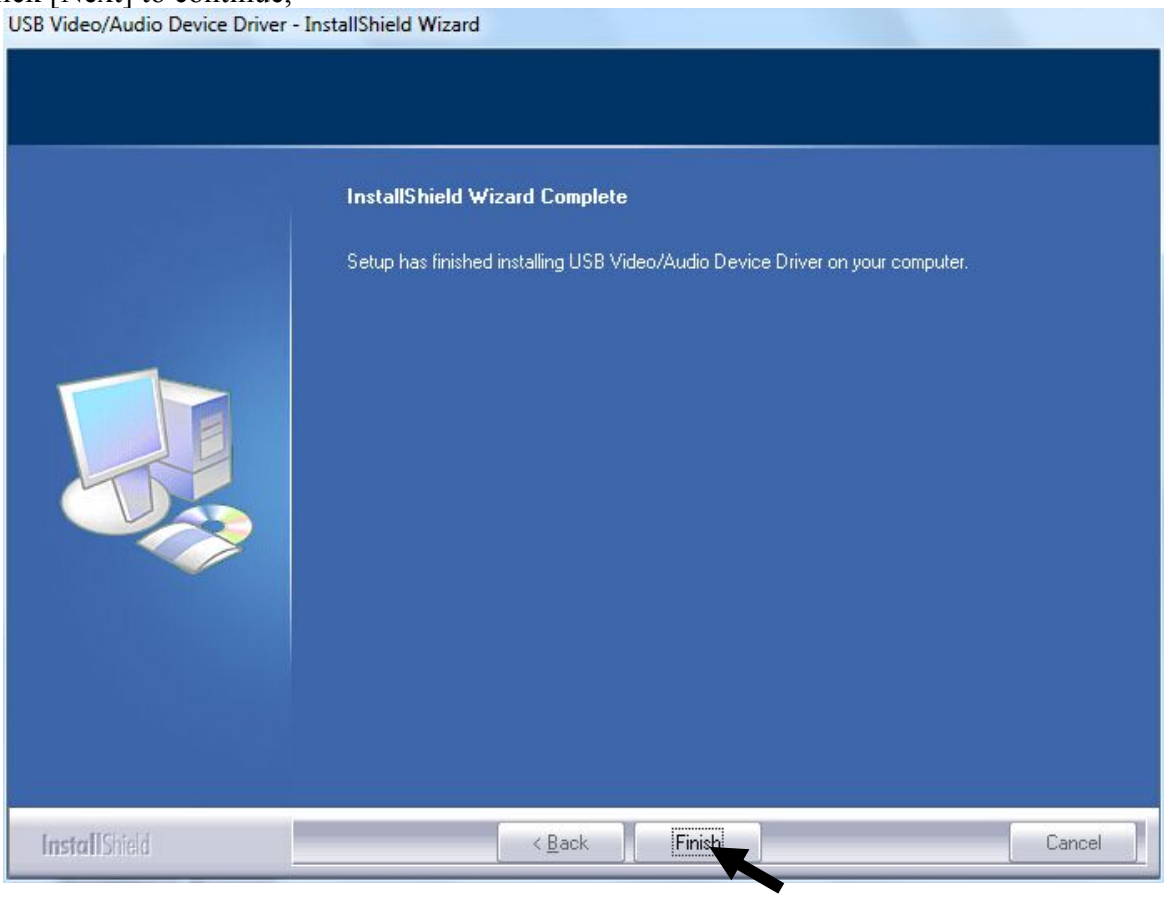
(2) Double click at profile

to open it and double click at

to start installation


USB Video/Audio Device Driver - InstallShield Wizard
Welcome to the InstallShield Wizard for USB Video/Audio Device Driver
The InstallShield Wizard will install USB Video/Audio Device Driver on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

(3) Click [Next] to continue,

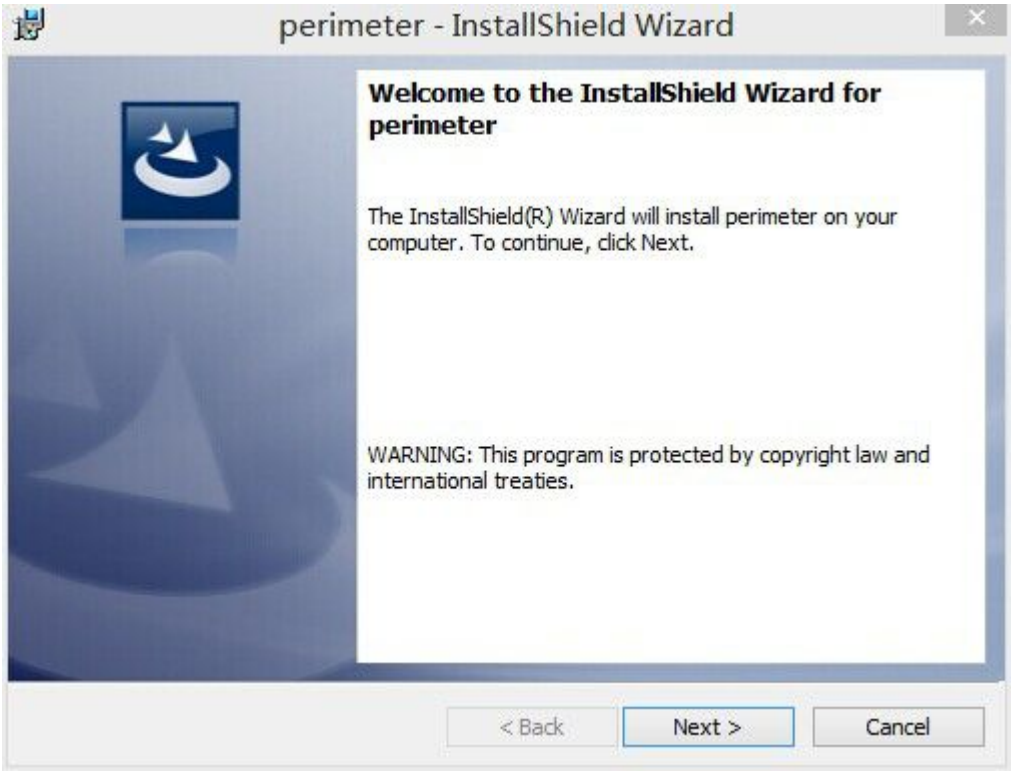


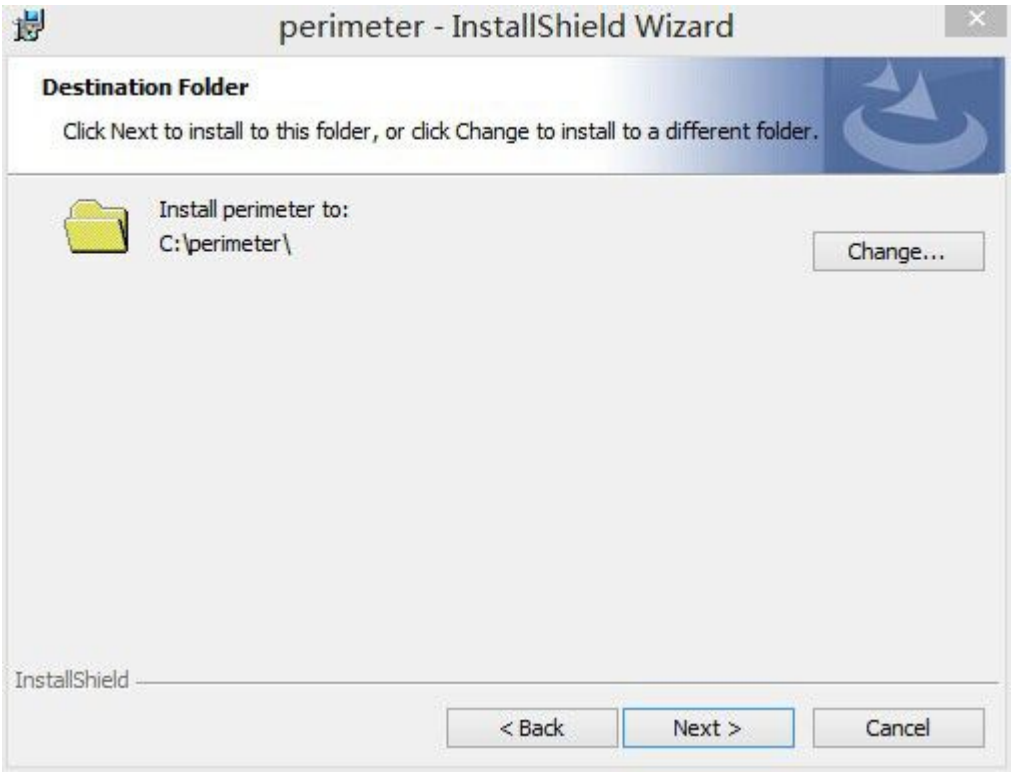
(4).Click [Finish] icon, restart the computer.

5.4.2 Open the file of perimeter software and double click on icon **to start the**

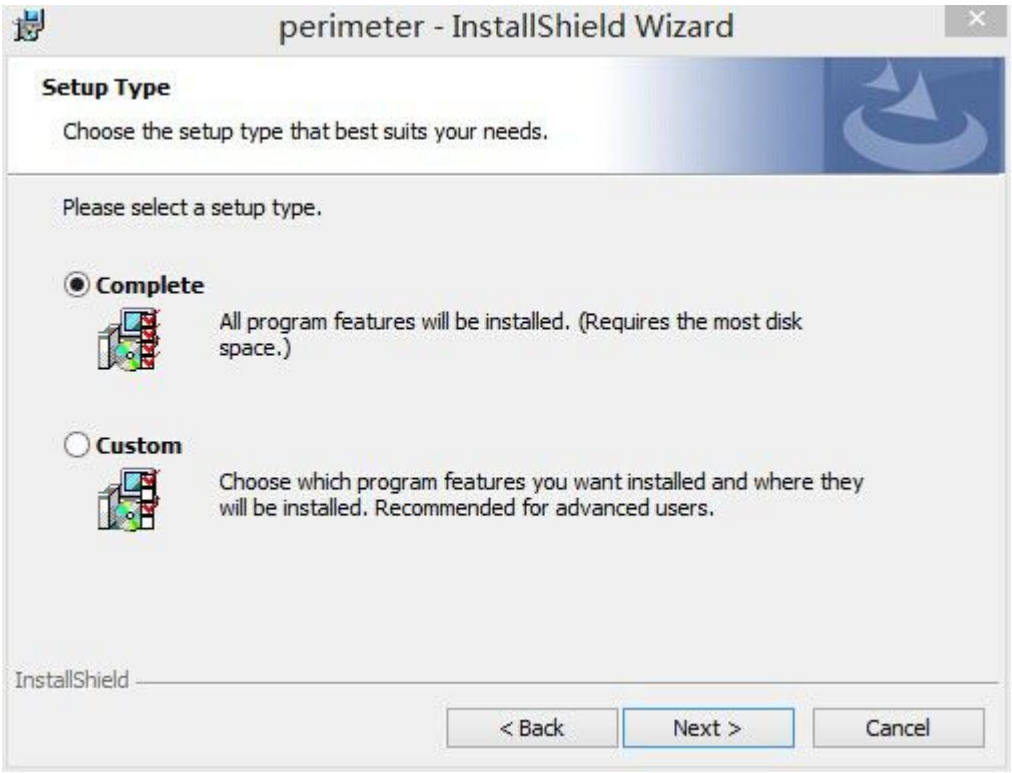
installation process.

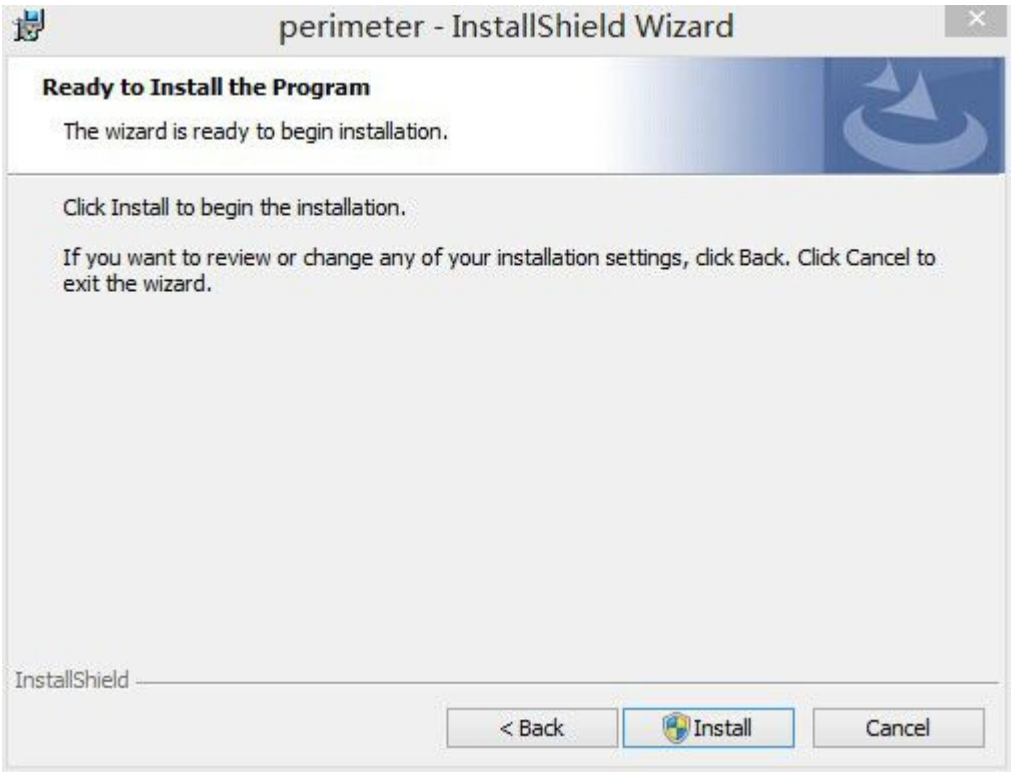
InstallShield Wizard
Preparing to Install...
perimeter Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.
Extracting: perimeter.msi
Cancel

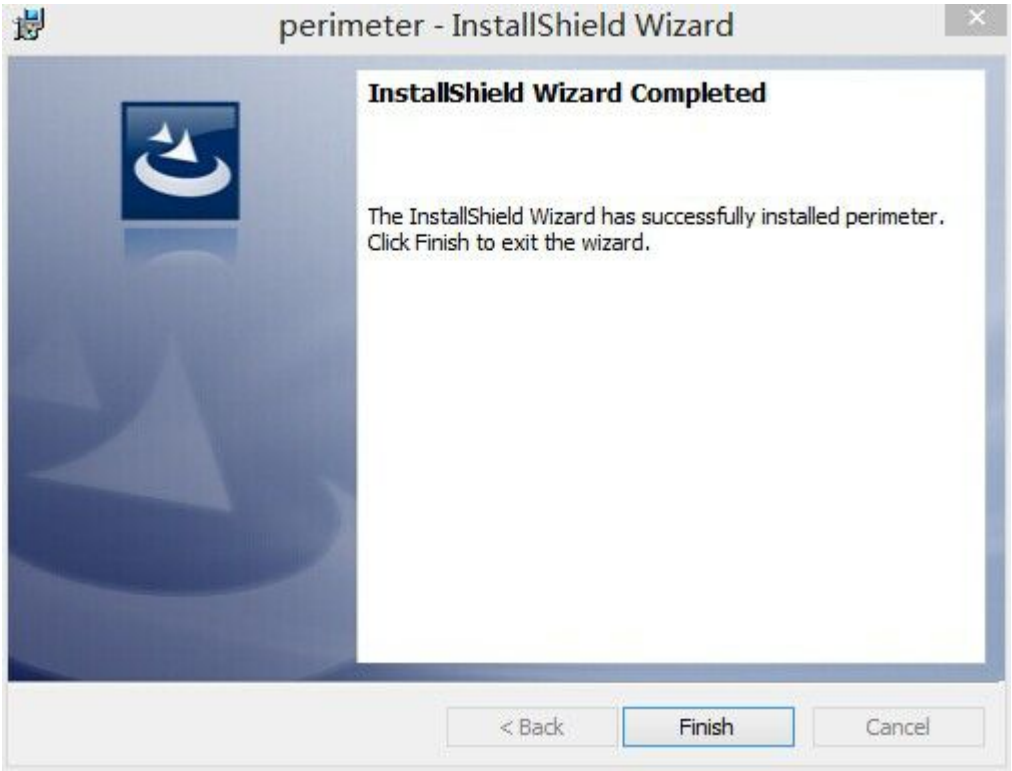

perimeter - InstallShield Wizard
Welcome to the InstallShield Wizard for perimeter
The InstallShield(R) Wizard will install perimeter on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel



Relocate the file path, recommend Disc D:/ for patient data security.


perimeter - InstallShield Wizard
Setup Type
Choose the setup type that best suits your needs.
Please select a setup type.
Complete
All program features will be installed. (Requires the most disk space.)
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel


perimeter - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

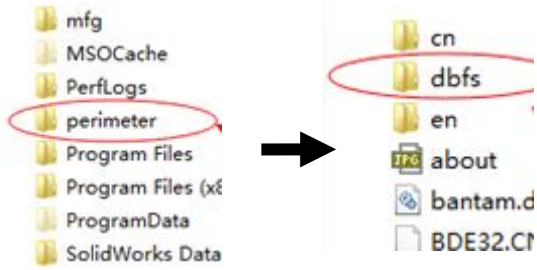

perimeter - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed perimeter. Click Finish to exit the wizard.
< Back
Finish
Cancel

5.5、Database backup

Once the software running and have patient to be checked, there will be patient database generate automatically. For database safety, or while upgrading software or reinstalling the Windows system needed,all patient database should be backup up as followed steps:

Find perimeter program installation directory which as proceeded in 5.4.2, find the location of

[Perimeter] file and open it,copy the file [dbfs] which is the database file and backup it safety. Operator can recover the data by copy and paste this file back to [Perimeter] file and overwrite.



5.6 After the software installed, you rarely need to maintain it, if there is new software for update, all you need to do is install the new software again.

Virus, serious wrong operate or hardware system failure may cause damage of the equipment, If the software damaged seriously, please do as following step:

► Install operating system for computer, we suggest to use Windows XP Professional or Win7

► If the software cannot be identified automatically, please continue to finish the installation manually

The drive program is located in the file our software disk provide.

Install 2860 video capture drive program, the drive program located in file our software disk provide

Chapter 4 Function of software

1. Main function of software：

（1）**Visual Checking**

The main functions of this module are for: visual checking, statistic analysis of the checking result, storing the data and printing;

（2）**2 File Management**

The main functions are: file searching, report comparison and printing, document deleting;

2. Start and close software

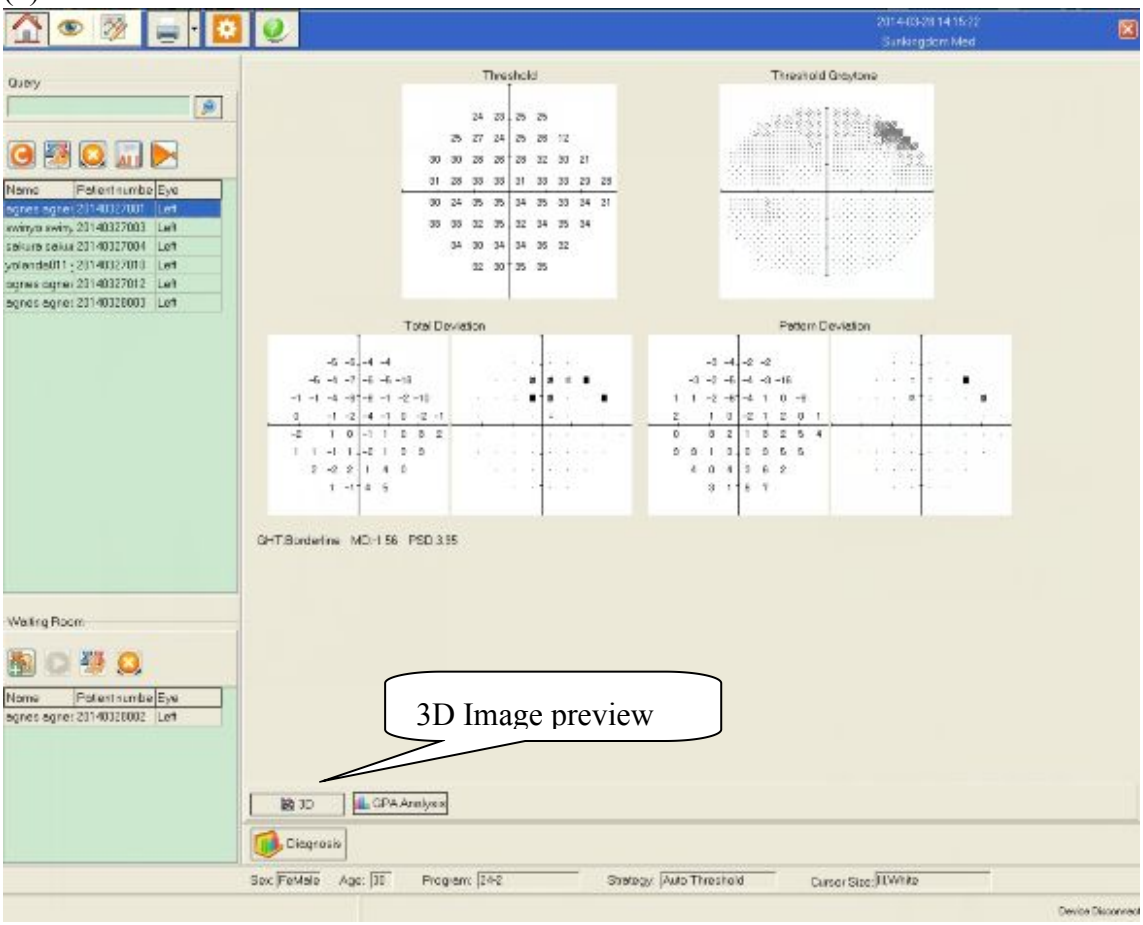
（1）Start：Double click the icon of

on desktop

（2）Close：Click on the icon of which locate at the upper-right corner

3. Introduction of the Operation System

(1) There are five interface of EPR-3600 software.

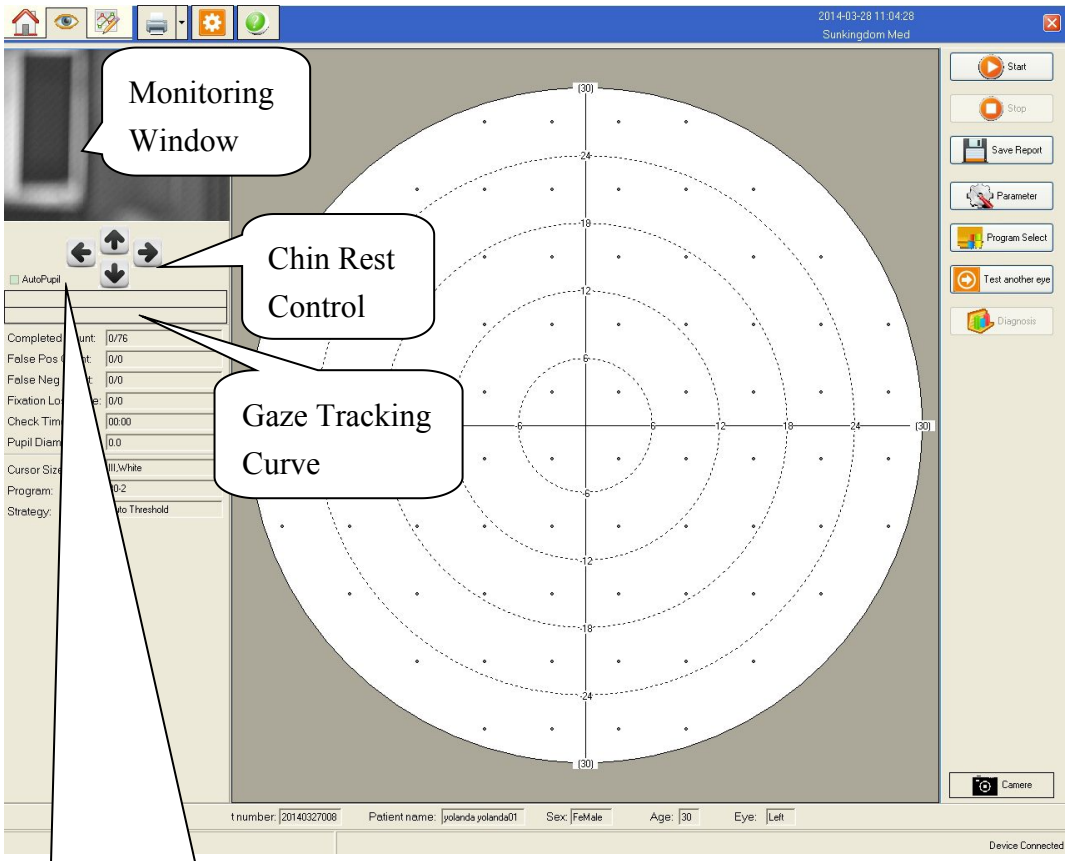


Home interface

Interface Bar: Back to Home interface, Back to Examination interface, User-define test interface, Printing, System setting and About us

Patient info area: Recheck (the same eye of same patient) , Edit, Delete(Selected patient data), All patient list, Last record

Waiting area: Register new patient, Start check, Edit, Delete



Testing interface

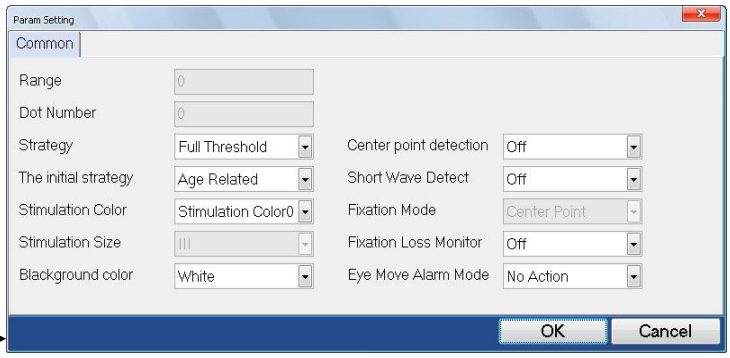
[NEW] Auto pupil monitoring – The system will adjust the chinrest automatically according to pupil monitoring-Doctors do not need to monitor the whole testing after starting the test

Start test

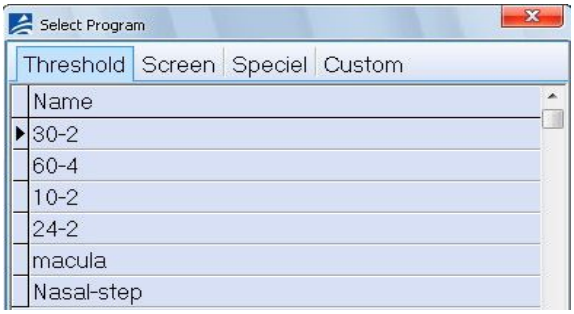
Stop the test

Save the test result

Setting the parameter



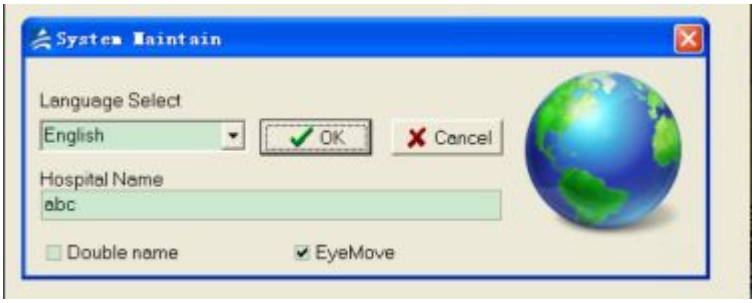
Select test program



Test another eye

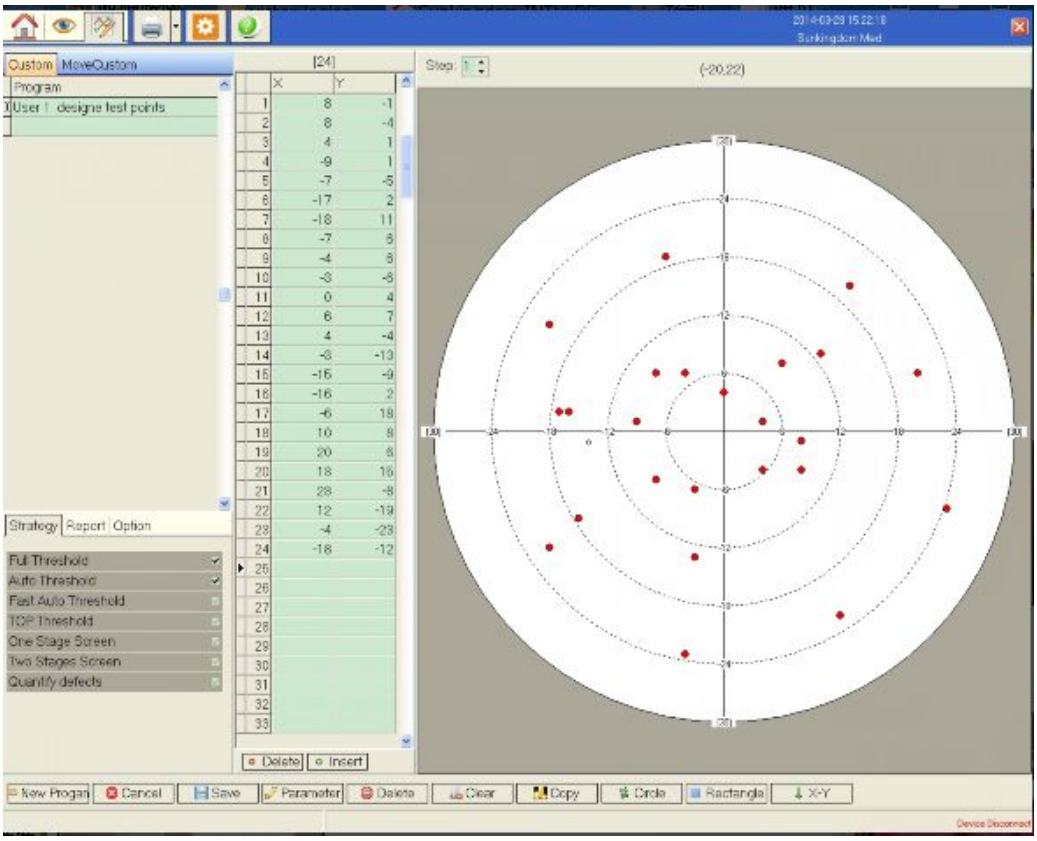
Diagnosis inputting

System setting interface



Double Name: For EU, USA and AUS. etc market which need the first name and family name inputting.

Gaze Tracking/EyeMove: Tick on for activating the gaze tracking function which will generate gaze tracking curve and Auto pupil measurement function.

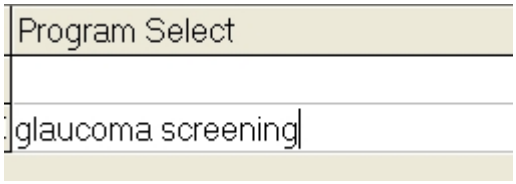


User-defined test interface

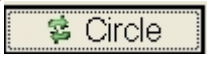
Firstly please click the bottom left

in the interface to set up a new programme, then input the programme name, and click

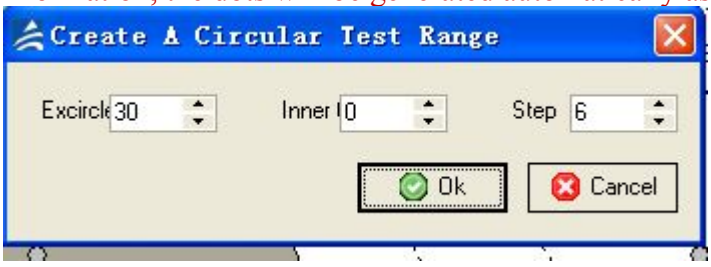
to save the defined programme as following



The second step is:There are four method to choose the dot position for user defined programme

Method One: Stationing the test dots as with circular, Click 

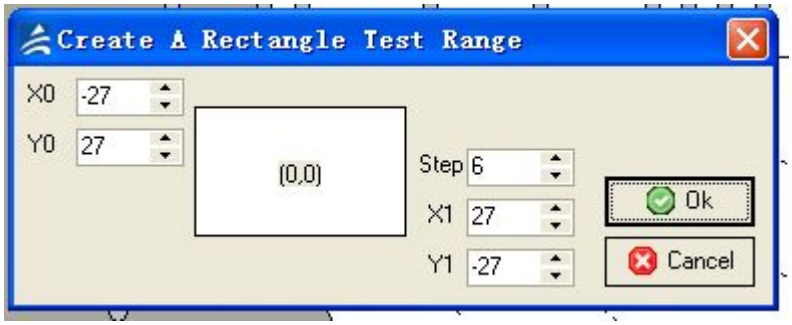
to input the inner circle and external circle scope and the space between dots, the unit will be the centrifugal degree, after input all these information, the dots will be generated automatically as following



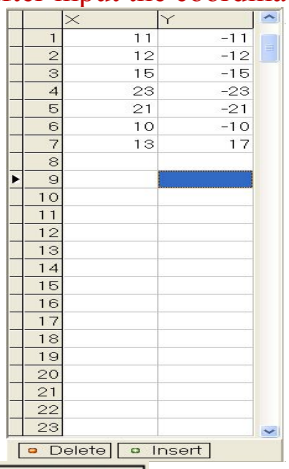
Method Two:Stationing the test dots with rectangle, Click

to input the coodinate degree of opposite angles of the rectangle, and the space between dots, the unit will be the centrifugal degree, after input all these information, the dots will be generated automatically as

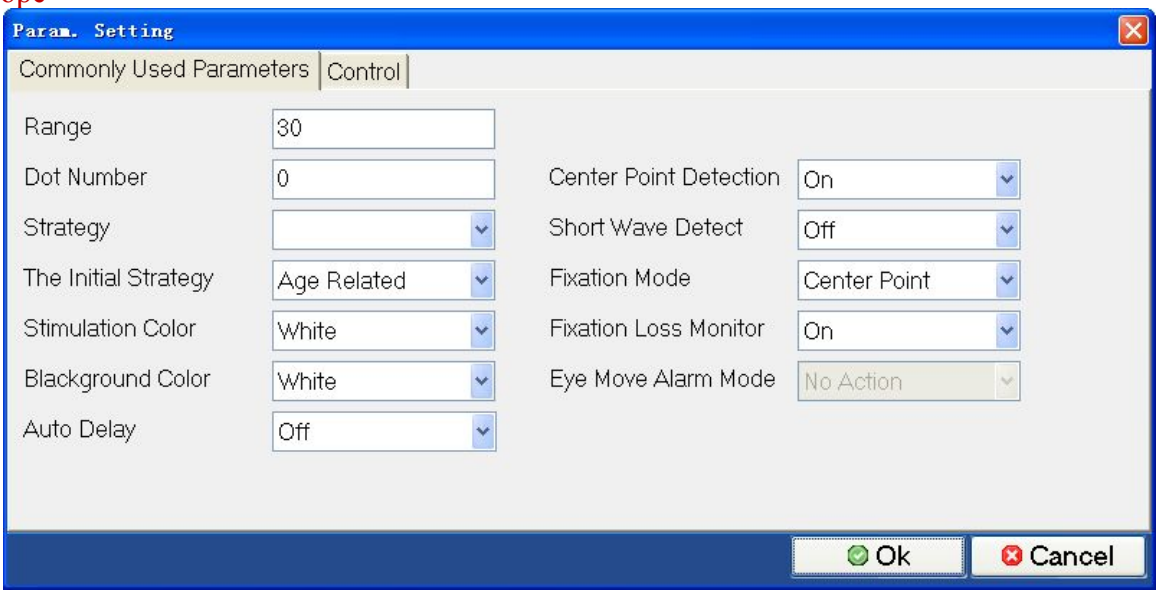
following:



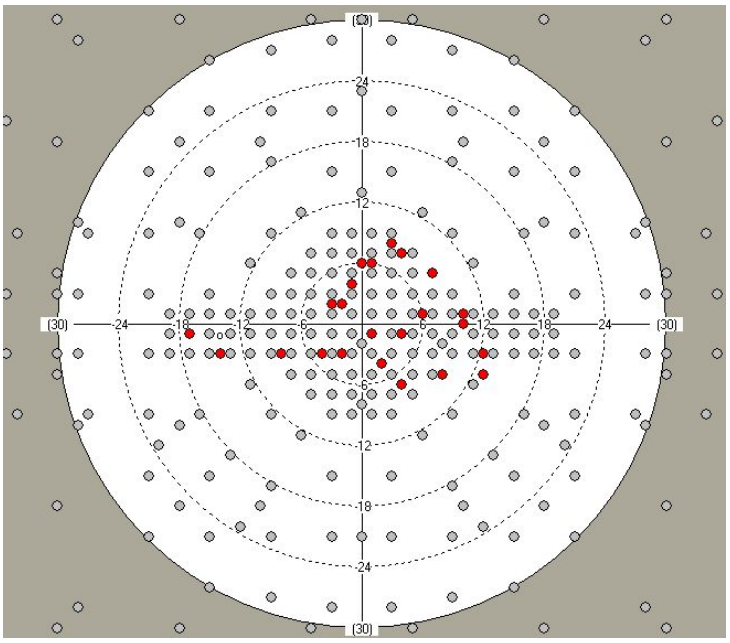
Method Three: Input the coordinate degree inside of the X and Y coordinate bar directly, the unit will be the centrifugal degree, after input the coordinate degree click Save as following:



Method Four: Click Param. Settir, setting "test scope" first and then the centrifugal degree of "test scope"



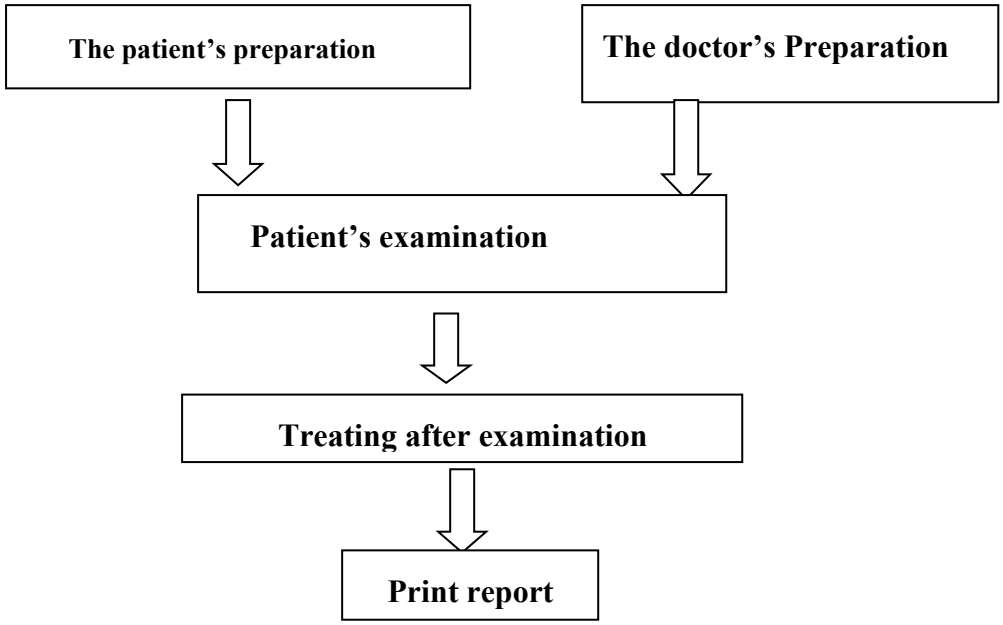
And then click the testing dots you want to choose directly as shown below:



(2)Several important programs and parameters of visual testing

First choose a Testing Program (threshold test, screen test, special, custom). Once the program is selected, go to the Parameter to choose a Strategy (full threshold, auto threshold, fast auto threshold) accordingly.

4. Operation Step



5. Doctor's Preparation

5.1 Power on the perimeter and Enter into the perimeter system as the way in **5.2**;

Notes:

After powering on the perimeter, it will take 3~4 minutes for a self-checking by running the stimulus lights automatically. This will guarantee the test accuracy. Do not treat it as an

system error and do not enter into testing procedure while self-checking in processing, the system will not run correctly. Enter the testing only after self-checking finished.

5.2 Input the patient's information;

5.3 Operator should inform patient the examination process before the examination:

1) The patient should be familiar with the responder: demonstrate him the right way of responding, the way of clicking the responder, and make him relax as soon as possible.

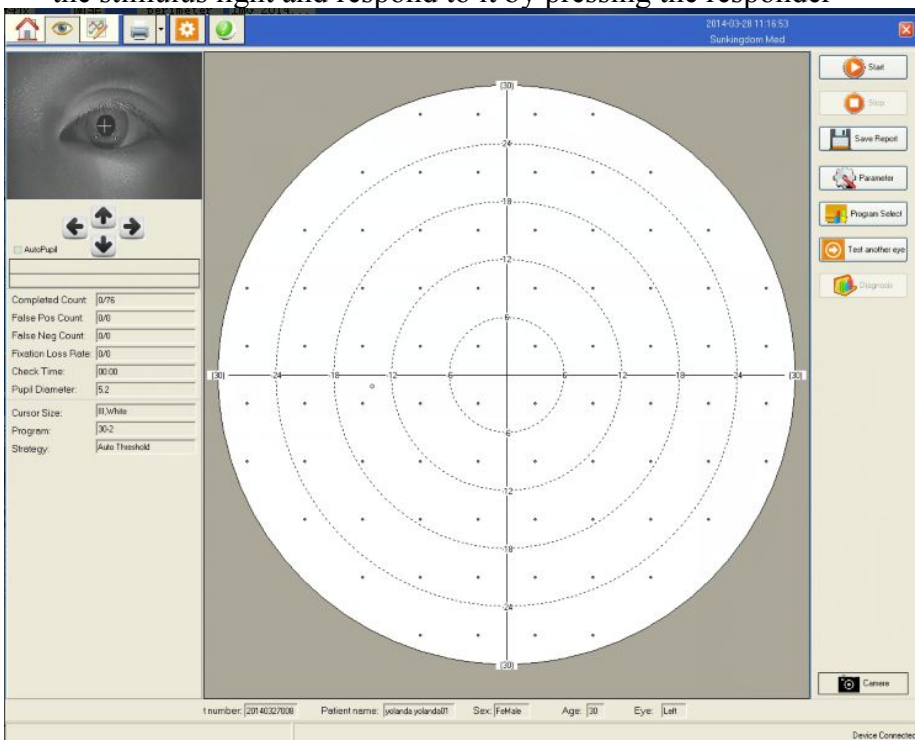
2) Demonstration him the fixing sight

3) Cover the patient's eye which will not be tested with an eye shroud.

4) Put the patient's jaw on the right side of the chin rest when examining the left eye; put the patient's jaw on the left of the chin rest when examining the right eye. If the patient testing Esterman binocular program, patient can either put their chin on left or right chinrest, but doctor need to adjust the cross in monitoring window aimed at center of patient's nose bridge.

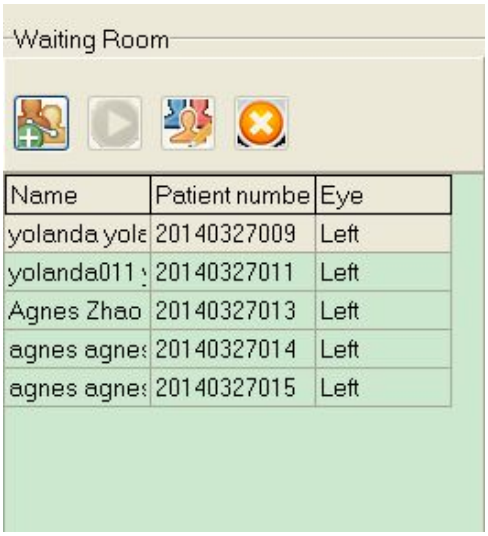
5) Put his forehead on the ribbon of the forehead bracket slightly.

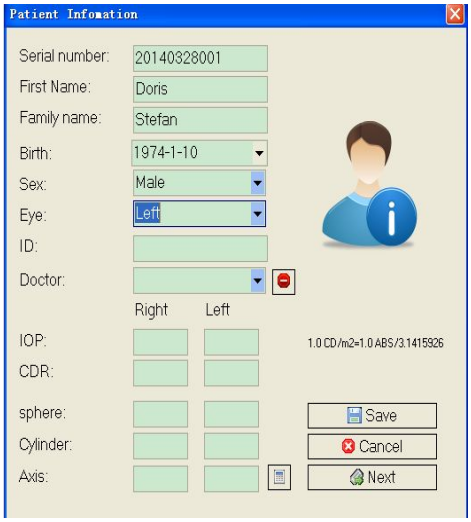
6) The eyeball shall stare at the center fixation light, and cannot move, only glance to perceive the stimulus light and respond to it by pressing the responder



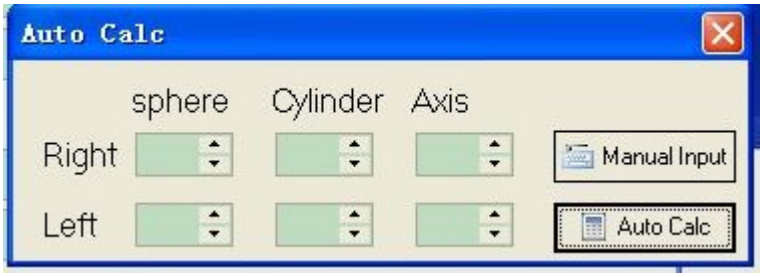
6. Starting Checking

6.1 Before you start the test, you should Click the Register[ ] icon on the main interface to setup the patient profile and input the info of patient, a patient profile will be saved automatically after you clicking [Save] .



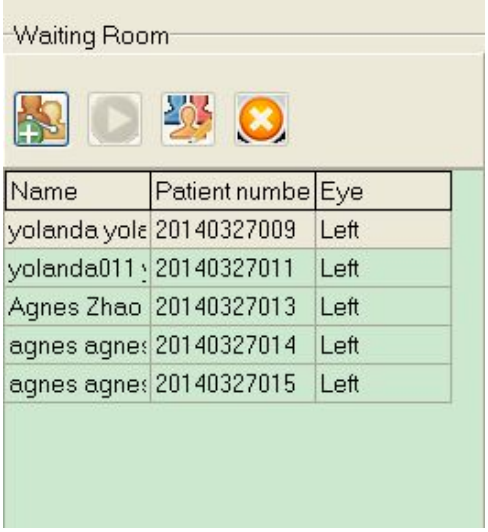


Patient with myopia, hyperopia and astigmatism will need to correct their diopter before starting the testing, our perimeter set trial lens holder for this function. Click on the icon of [ ] and inputting patient's real refractive diopter, then click on the [Auto Calc] to get the corrected lens you need to put on perimeter trial lens holder.



For example, if we inputting -5.0D under Sphere of Right eye, click on Auto Calc, the system will generate the corrected lens need to adapt for patient is -1.75D. Doctor should test the patient with a -1.75D corrected lens.

6.2 After save patient data, you can find the patient record at [Waiting Room].

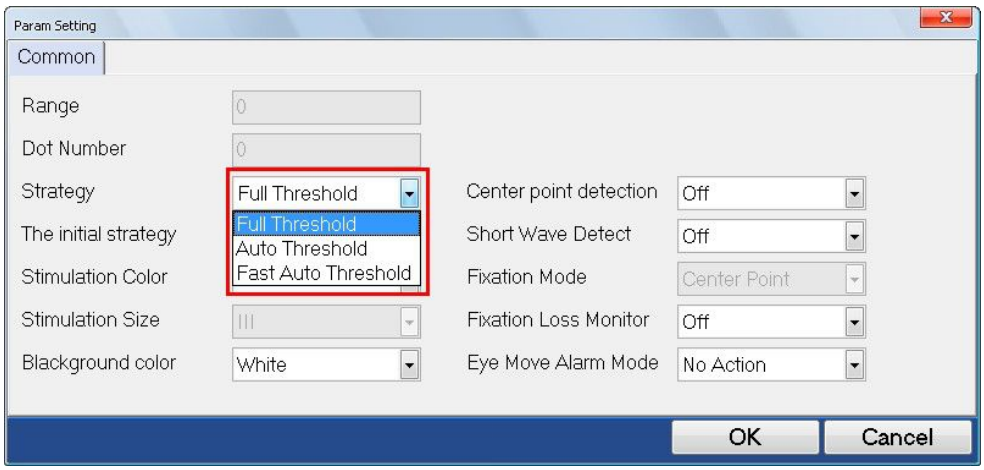


Click on the patient colume you wish to enter, and click on [ ] enter the testing Interface. The default testing program is 30-2,and strategy is auto threshold, if you want to change to other program, click at the Program Select , select the program

you want to use as following image.

Or, if you want to change the strategy, click at

and choose as below



Notes: The program and strategy will automatically resume to default value once currently testing finished. System will not memory your last program and strategy setting. Operator need to proceed this process if default value needed to be changed.

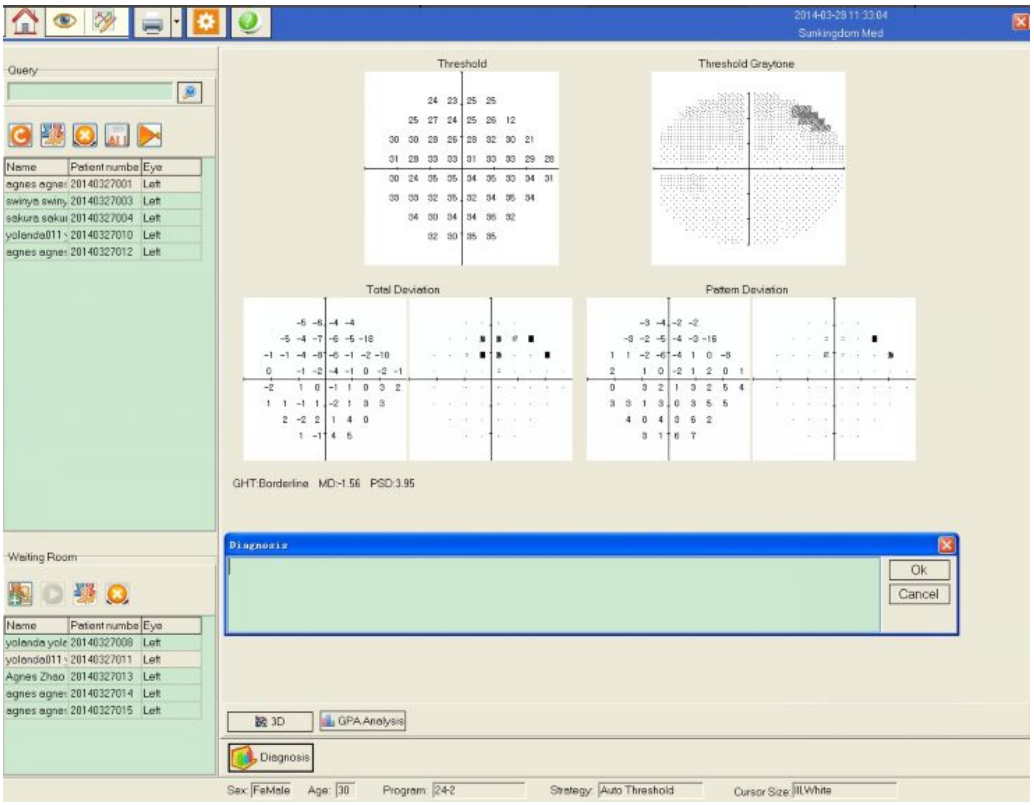
6.3 Then click

to start testing. During the testing, doctor can use the function of [Auto Puil] monitoring so that do not need to monitor the whole process personally. The system will adjust the chinrest the headrest automatically.

6.4 [Pause] and [Stop] testing
During testing , operator can Pause and Stop testing by clicking icon locate at right side of tesing interface.

6.5 After testing, you should save the test result by clicking at

and then you can diagnosis.



6.6 Click at the , choose the test report you need and preview. There are Single, 3in1, and Overview test report optional.

6.7 If your patient have come to you and test for several times, you should use the Overview report to see the progressing of patient.

For doing more than one test with a same patient, you should click to proceed.

For GPA analysis, at least 3 reports of (24-2 or 30-2) of same client shall be generated before running this function.

6.8 Patient List

Through this section, you can delete a patient profile by clicking the icon of ,and find/recall a patient profile by clicking the icon of after you inputting the keywords

6.7 Test report reliability

Number of testing dots means the total number of testing dots of the perimeter

(1). False Negative Errors (False NEG Errors):

False Negative errors occur when the patient does not respond to a suprathreshold stimulus in an area where the threshold has already been measured. The interpretation of false-negative errors is not as clear as that of false-positive ones, because they can be produced by a variety of sources. Visual field test results of patients whose false negative errors exceed 33% are not considered reliable.

(2). False Positive Errors (False POS Errors):

False positive errors occur if patients respond when no stimulus is presented. For the purposes of this study, we define a false positive response as randomly occurring, independent of stimulus presentation, and hence independent of any monitored response window. The system will count it and if it's over 20%, the test report will be treated as unreliable. Visual field test results of patients whose false positive errors exceed 33% are not considered reliable.

(3). Fixation Loss

Fixation losses occur when the patient's eye wanders from the fixation target. Visual field test results of patients whose fixation losses exceed 20% are not considered reliable.

(4). Percentage(Expressed as Letter P)

Less than 5 people within 100 people have this kind of visual situation

Less than 2 people within 100 people have this kind of visual situation

Less than 1 people within 100 people have this kind of visual situation

Less than 0.5 people within 100 people have this kind of visual situation

(5). Total deviation

The difference between a patient's threshold sensitivity and the age-corrected normal sensitivity from the perimeter's internal normative database at each tested location of the visual field.

(6). Pattern deviation (PD)

The localized loss at each tested point, after the removal of the effects of any generalized loss; pattern deviation decibel (dB) values are the total deviation values minus the general value

(7).Pattern standard deviation (PSD)

It is a measurement of the degree which the shape of the patient's measured field or hill of vision departs from the "NORMAL" age-corrected reference field model. The value is expressed in decibels and any value of 2dB or greater will have a (P) value next to it indicating the significance of the deviation

(8). Glaucoma Hemifield Test (GHT):

It is for automated evaluation of single static threshold visual field test results in glaucoma. It is also constructed to detect field loss that is symmetric around the horizontal meridian.

- Outside normal limits. The GHT is described as "outside normal limits" when differences between a matched pair of corresponding zones exceeds the difference found in 99% of the normal population, or when both members of a pair of zones are more abnormal than 99.5% of the individuals with the normative population.
- Borderline. The GHT is described as borderline when matched pairs of zones are abnormal at the 97th percentile within the normative database
- General reduction of sensitivity. Visual Fields (VF) are described to have generalized reduction of sensitivity when both conditions for "outside normal limits" are not met, and the best region of the VF is depressed to a level at the 99.5th percentile within individuals of the normative database.
- Abnormally high sensitivity. The GHT is described as having abnormally high sensitivity when the overall sensitivity in the affected region of the VF is better than 99.5% of individuals within the normative population.
- Within normal limits. VFs are described as being within normal limits when none of the above conditions are met.

(9).Mean Defects: (MD):

The average of the examination value of all spots minus normal value, it shows the condition of the patient's vision sensitivity comparing with those of the same age.

(10). Short Floating (SF):

It shows the light sensitivity deviation appearing in one perimeter examination process; it shows the reaction consistency in the course of examining. The bigger the value is, the worse the cooperation the patient shows. The short wave will become height in the scope of abnormal visual field. When more scope in the visual field become abnormal or the degree of abnormal increases, the whole wave will become higher.

(11).Decibel (dB)

In perimetry, the intensity of a stimulus expressed as 0.1 log-unit of attenuation of the maximal available stimulus; the higher the dB, the dimmer the stimulus intensity.

(12).Fixation monitoring

Assessing the ability of the patient to maintain gaze by the experimenter's observation.

6.8 Introduction of test parameter

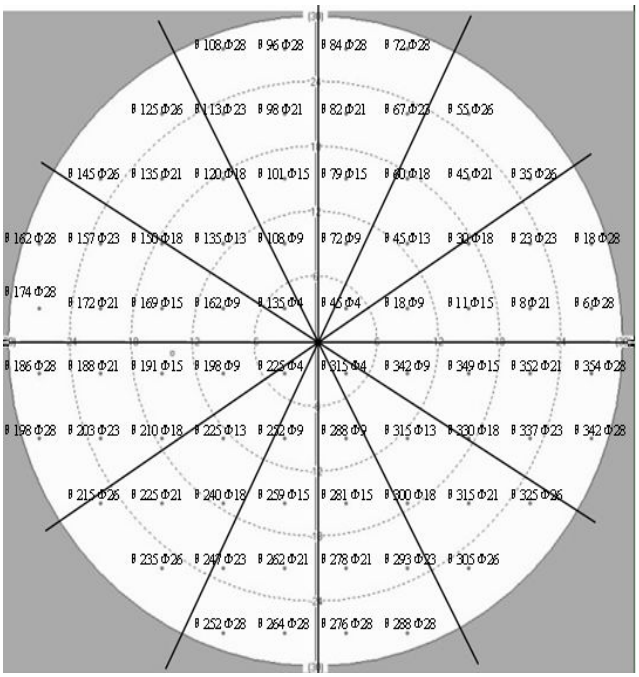
6.8.1. Threshold test program:

（1）30-2（recommend）

Main applications：Common test, glaucoma, optic nerve disease, retinal disease

Test Range：0°～30°

Test points：76 dots

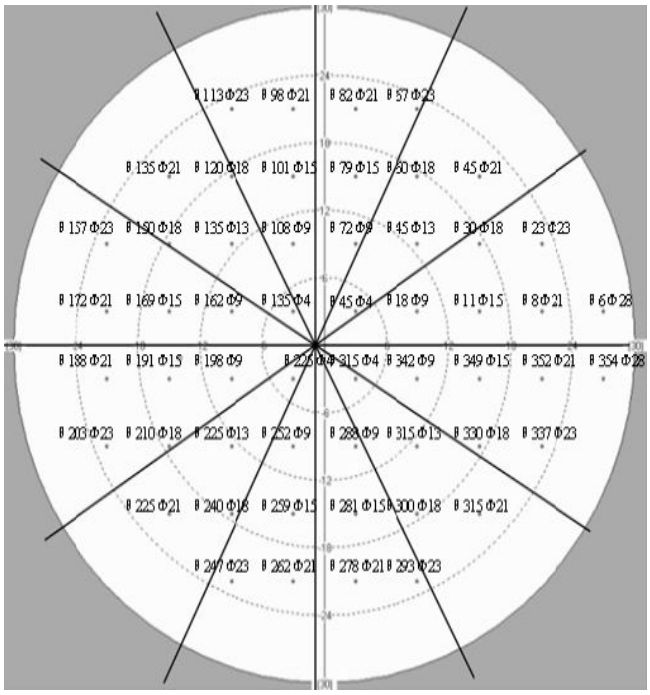


（2）24-2

Main applications：Common test, glaucoma, optic nerve disease

Test Range：0°～24°

Test points：54 dots

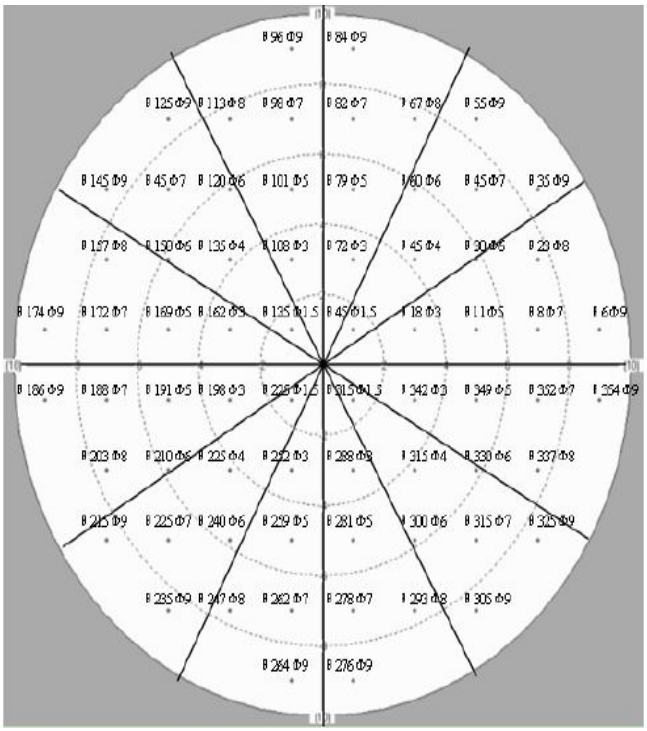


（3）10-2

Main applications：Macular disease, retinal disease, optic nerve disease, advanced glaucoma

Test Range：0°～10°

Test points：68 dots

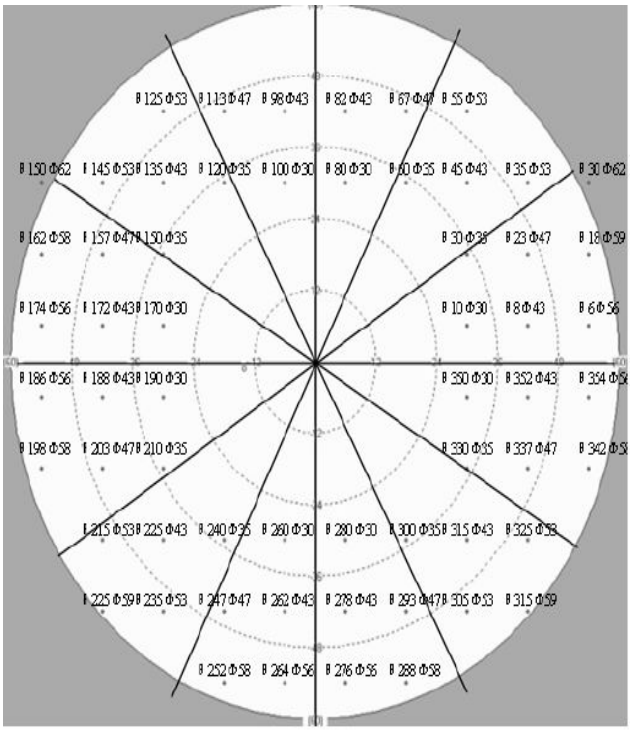


（4）60-4

Main applications：Retinal disease, glaucoma

Test Range：30°～60°

Test points：60 dots

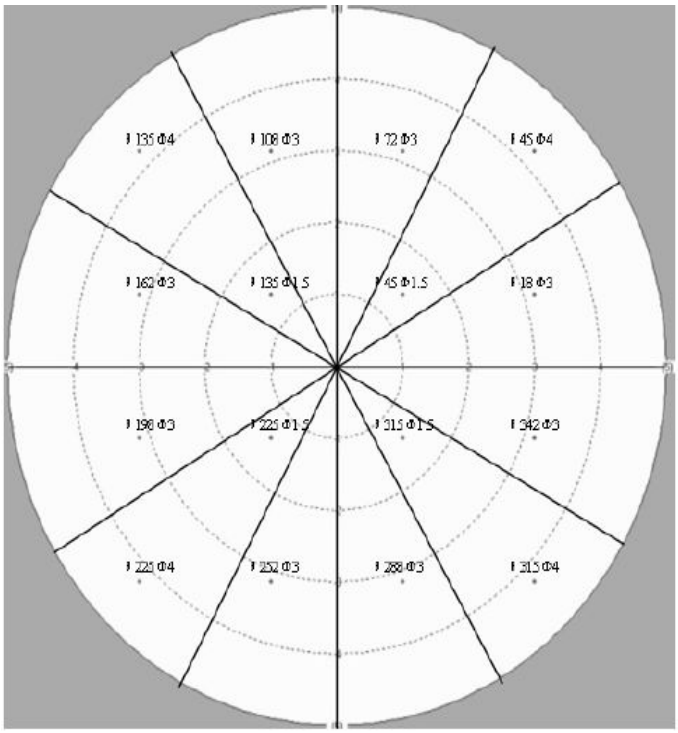


(5) Macula program:

Main applications：Macular disease

Test Range：0°～5°

Test points：16 dots

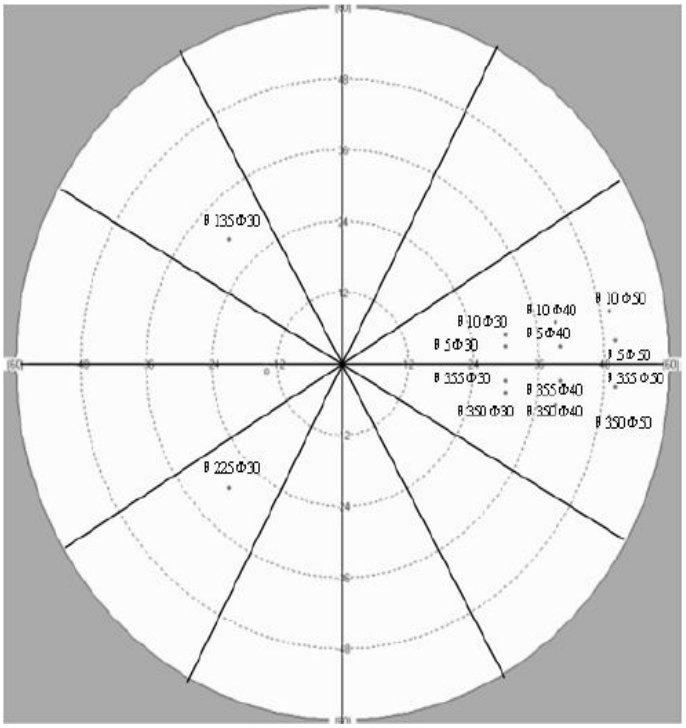


(6) Nasal step program：

Main applications：Glaucoma

Test Range：30°～50°

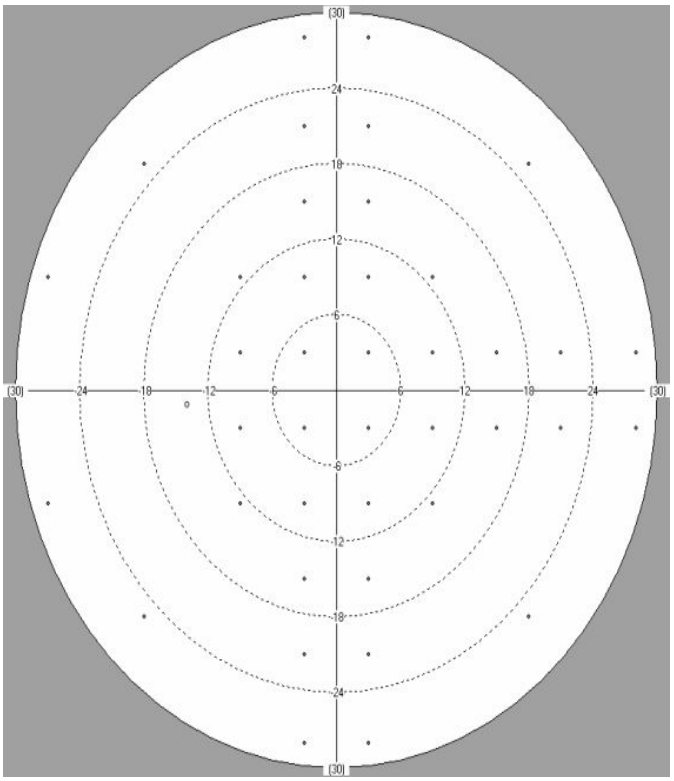
Test points：14 dots



6.8.2. Screening test program

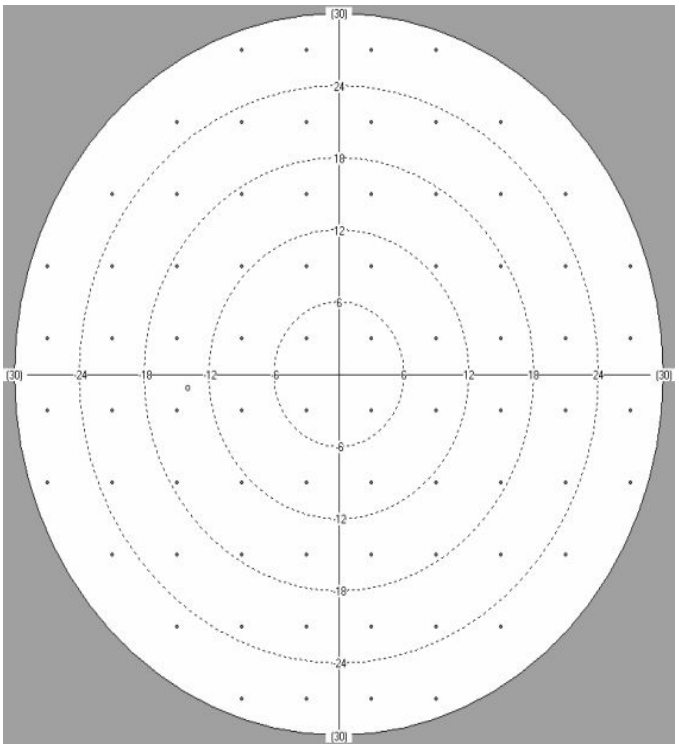
(1) C-40

Main applications：Common test
Test Range：0°～30°
Test points：40 dots



(2) C-76

Main applications：Common test,
glaucoma, optic nerve disease
Test Range：0°～30°
Test points: 76 dots

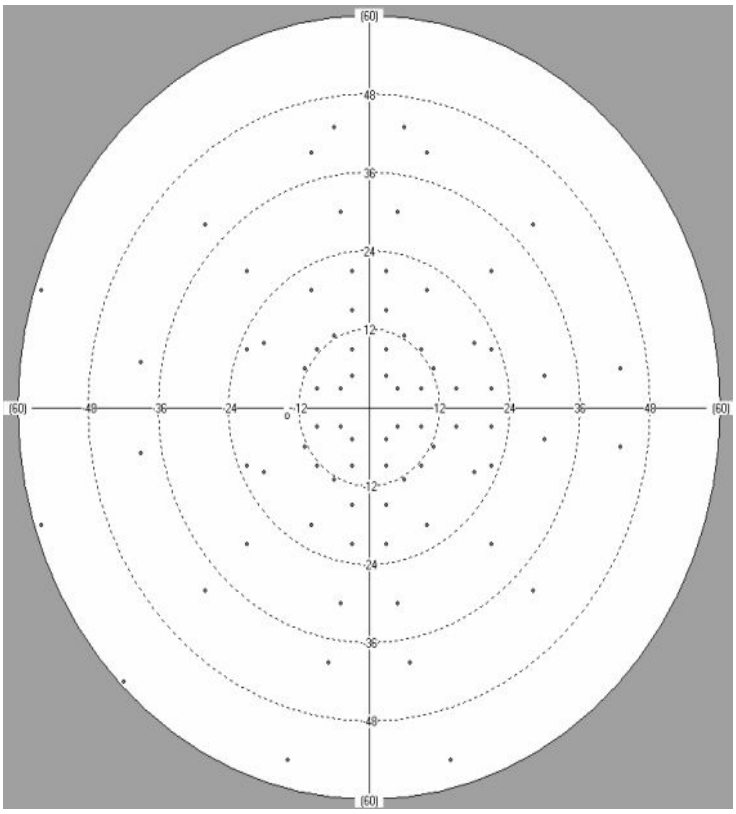


(3) FF-81

Main applications:Full-field screening test, retinal disease, glaucoma, optic nerve disease

Test Range：0°～60°

Test points：81 dots

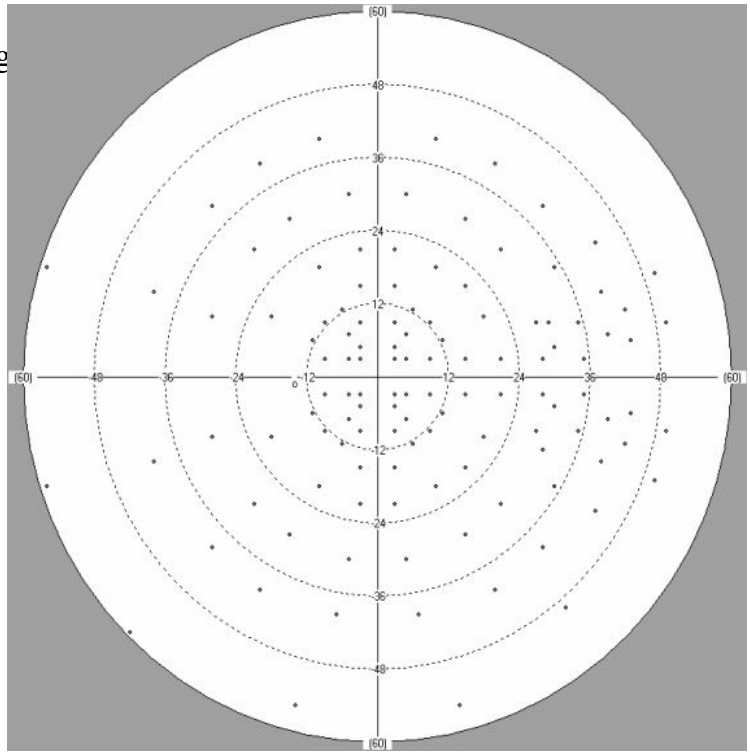


(4) FF-120

Main applications：Full-field screening test, retinal disease, glaucoma, optic nerve disease

Test Range：0°～60°

Test points：120 dots

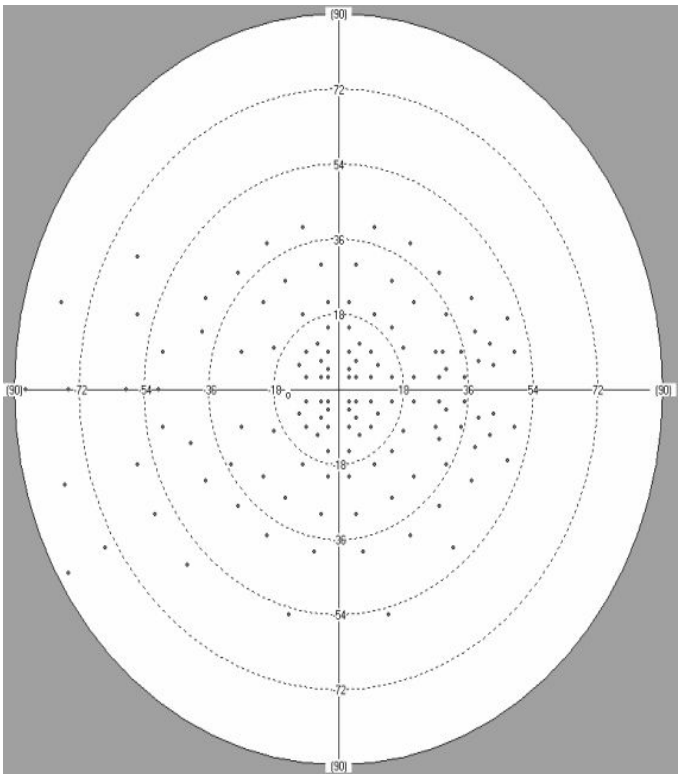


(5)FF-135

Main applications：Full-field screening test

Test Range：0°～55°，Temporal side 87°

Test points：135 dots



6.8.3. Specialty test program

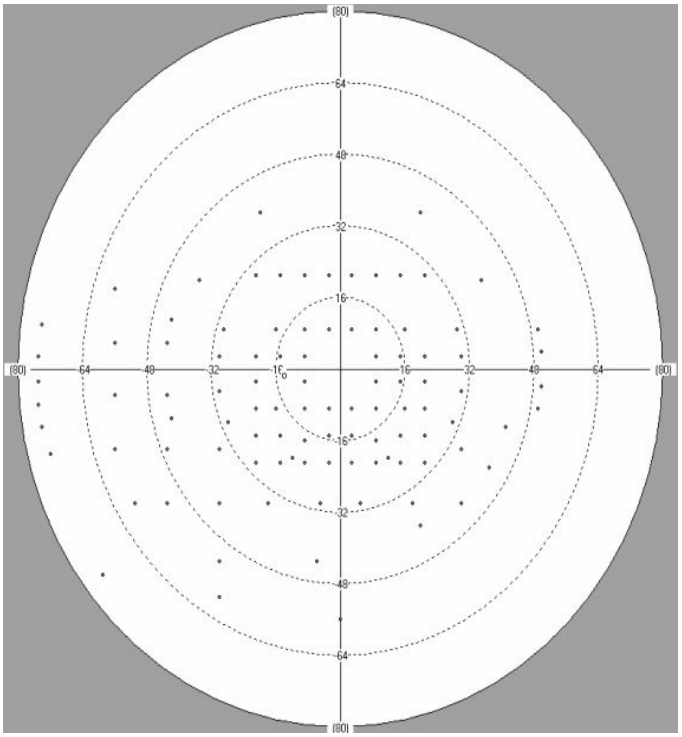
（1）Esterman monocular

Main applications：Driver test for single eye

Test Range：0°～60°，

Temporal side 75°

Test points：100 dots

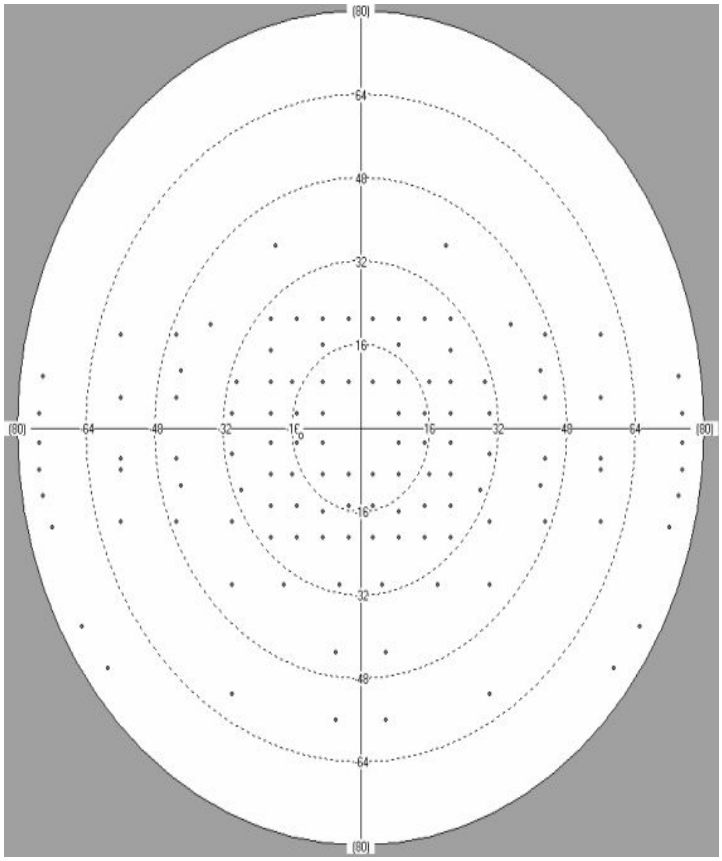


(2) Esterman binocular

Main applications：Driver test for double eyes

Test Range：Double temporal side 150°

Test points：120 dots



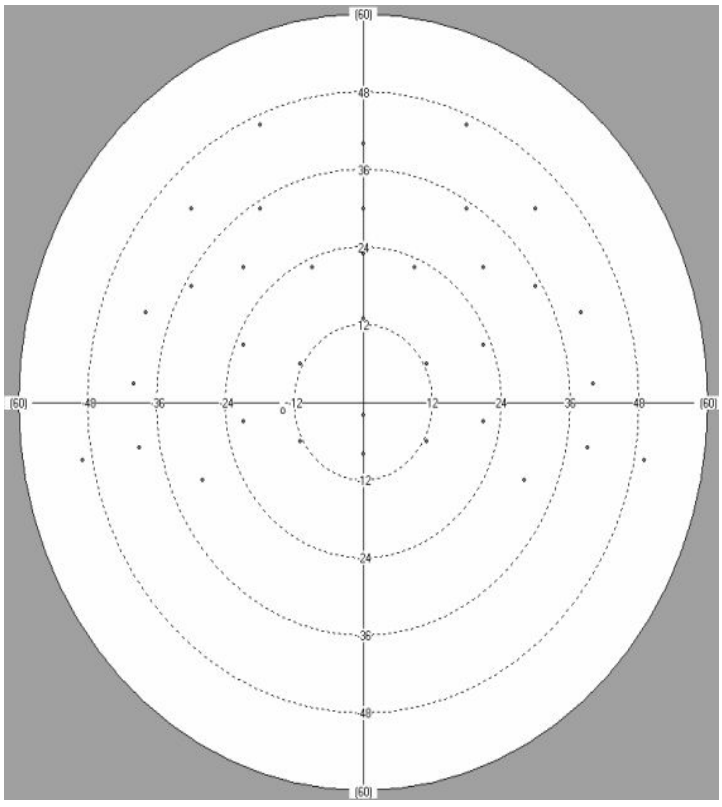
(3) Superior 36

Main applications：Screening upper visual field

Main applications：

upper visual field 60°

Test points：36 dots



6.8.4 Test Strategy

1. Threshold Strategy

(1) Full Threshold Strategy: It adopt 4-2 as standard for response

(2) Auto Threshold Strategy (recommend): Calculate and correct the stimulate value in the whole process of testing. Based on the response

(3)Fast Auto Threshold Strategy: Calculate and correct the stimulate value in the whole process of testing, variation range will be 50% faster than auto threshold strategy, Based on the response

2．Screening Strategy

(4) Zone 2: Stimulate with superior threshold value, Responded treat as normally

(5) Zone 3: Stimulate with superior threshold value, Responded treat as normally. If the patient do not response, it will stimulate with the brightest light, If the patient responsed, it will be recorded as relatively scotoma, if still without response, it will be recorded as definite scotoma

(6)Single Stimulate: Stimulate with stationary brightness

6.8.5 Perimeter Academic Discourse

Different Light Threshold: Under the circumstance of stationary lighting, if the stimulate spot visibility is 50%, then this spot stimulate intensity will be different light threshold

Vision Island: The altitude means light sensitivity, the area means the islands scope, image the visual field as an island in the sea, every spots of the retina will corresponding a position on the island, The spots fixation spot which is the macular area with highest sensitivity, constitute the peak of the island, and the around area the sensitivity will be lower, which constitute the circum area of the vision island.

Visual Isopter: The vertical height of the spot on vision island means the visual acuity, the lines on the same vertical height is the isoheight, in visual foeld the name is isopter.

Physiological Blind Spot: The optic nerve which without photoreceptor cell is located at 15degree bitamporal of the visual fixation point, there area can not see things, that is the physiological blind spot, in the visual island its shown as a vertical deep hole.

Tubular visual filed(Center visual island): The visual field shrink to centrality extremely. Only remaining the visual field about 5-10degree

Sector-shaped Depression (Wedge-shaped Defect): The board line of the visual field defect will move along two ways of the visual field, the defect will look like a sector, the tip is point to the physiologic blind spot. Its meanly appeared in the bitamporal defect

Tetarfanopia Depression: Its also named quadrantanopia, the two board line of the defect is one vertical diameter line and one horizontal diameter line, the defect area occupied a whole quadrant

Hemoanopia：There are vertical and horizontal hemoanopia two types. For vertical, the board line is central vertical, for horizontal the board line is horizontal diameter line

Macular Sparing: Its mainly appeared in the vertical hempanopia, which will retain about 5degree visual at the center area, the macular sparing is remind the defect location is at visual pay-off

Scotoma：Means the abnormal visual field reduce area or vision disappear area, that is the sensitivity of this area is lower than other area around, all the scotomas except the blind spot and verse shadow are abnormal

Centralcecal Scotoma: The scotoma which covered the fixation point, accompany with hypopsia, that means the sickness have been influenced the retina or the fibre bundle of the optic nerve

Blind Area Scotoma: The center scotoma which covered the bind spot, which is remind the damage of macular fibre

Paracentral Scotoma: It means the visual defect in the area of center5-25degree, the diameter is bigger than 5degree, the depth is bigger than 5dB

Arcuate Scotoma: The arcuate shaped scotoma which connected the area which around fixation point upper and lower and the blind spot. The nasal side will wider than bitamporal, and suddenly disappear at horizontal meridian line

Ring Scotoma: The connected the horizontal joint of upper and lower arcuate scotoma surround nasal side of central fixation area

Relative Scotoma: When the stimulate light get stronger, the scotoma will disappear

Absolute Scotoma: When the stimulate light adjusted to the most brightness the patient cannot see it still, the physiologic scotoma is a topical absolute scotoma

Junctional Scotoma: Caused by the damage of the junction area of one side optic nerve and optic chiasma. Shown as hemianopsia at ipsilateral central scotoma and contralateral bitamporal upper quadrant

Nasal Step: The threshold value of up and down side of nasal vision horizontal meridian are entirely different

Localized Depression: The light sensitivity reduce at locality, but not form to scotoma, its named

localized depression, its shown as visual isopter localized depression which is different to scotoma, the scotoma are surrounded by relatively normal vision field, but at least one direction of the localized depression without clearly board line(Normally its telecentric direction). Nasal step, bitamporal visual isopter and wedge-shape depression are the typical localized depression

Generalized Depression: Light sensitivity of entire visual field consistency decline. When use kinetic checking it shows all visual isopter shrink centripetalism, when use static checking it shows the dB value decline consistency, the threshold value is generally higher

6.8.6 Data Recover and Backup

1. Medical record(Test report) backup

The software will be default installed in C:\Perimeter, and the data will be stored in C:\perimeter\dbfs. For most of time, the system is safe and reliable

But as the report is very important, to avoid lose data because of virus or computer failure, we advice to backup the the report data weekly or monthly

Backup method: Quit from the perimeter are, copy the whole folder of C:\perimeter\dbfs and paste it to the target folder, we suggest to discs data and label the date on it

2. Medical record(Test report) recover

Normally you don't have to recover the data, But sometimes the computer may broken because of virus and system failure, you have to format folder C which will lead to data lose while reinstall the system, after fixed the computer you have to reinstall the system and recover the data from the back up folder.

Firstly select the one you want to recover from the back up, copy and paste them to the same folder of C:\perimeter

Chapter 5 Maintenance

5.1 Common Problems

Breakdown	Cause	Treating methods
Can't start system or system doesn't work	Failed to setup USB device	Re-set USB device
	Voltage isn't enough or too high	Replace power
	Memory lost or damaged	Insert again or replace the computer memory card
	Infect virus	Use anti-virus software to scan virus
	Crashes while working or show that the program is wrong.	Open too many application programs, re-start the computer
	Hard disk is damaged	Replace the hard disk
Nothing in the screen when opening it	LCD monitor doesn't display any image	Properly connect the wire, switch on power
The responder does not work	Connection wire is damaged	Replace the Connection wire
	Pressing button is damaged	Replace the pressing key
	The controlling card in the stimulator does not work	Replace or maintain the controlling card

5.2 Maintenance

5.2.1 You should firstly turn on the power switch of the monitor and then turn on the power switch of the main frame when opening the machine. When closing it, you should firstly log out, and then turn off the power supply of the monitor and the main frame.

5.2.2 Scan disk and arrange pieces in a certain period.

5.2.3 Keep air clean, dry; use air-conditioner if possible

5.2.4 If the instrument has not been used for a long time, you should supply power for the main frame at intervals. (Usually three times a week, four hours one time)

5.2.5 If there is something wrong with the instrument, please contact us immediately or ask the special maintainers to maintain.

Notes: You should clean the chin rest before and after each time you use it.

5.3 Fusing Parts:

Model of fuse: φ5×20mm, T2A L250V

Replace the fuse: Screw off the cover of fuse, replace it with a new good fuse, then cover again (see the picture of the perimeter)

Chapter 6 Declarations

We can provide you with the information of those parts need maintained.

1. We will provide maintenance and enquiry free for one life.
2. We will maintain the machine for free for one year since the date of purchasing if the machine is operated according to the operation instruction.
3. During the maintenance, we will charge fee for the maintenance under the following conditions

- Do not use, maintain, store the instruments according to operation instruction;
- Take apart or amend the instruments without the permission of us, which cause damage;
- Damages is caused by accidents, use wrongly or caused by other major nature factors.
- Please forgive us for not informing you if the design or the assigned type changes.

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